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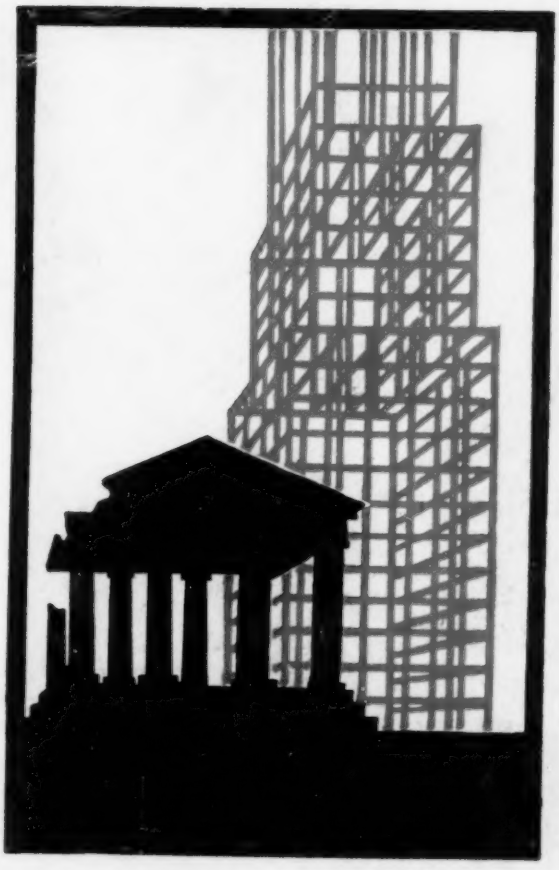
THE ARCHITECTURAL RECORD



JULY
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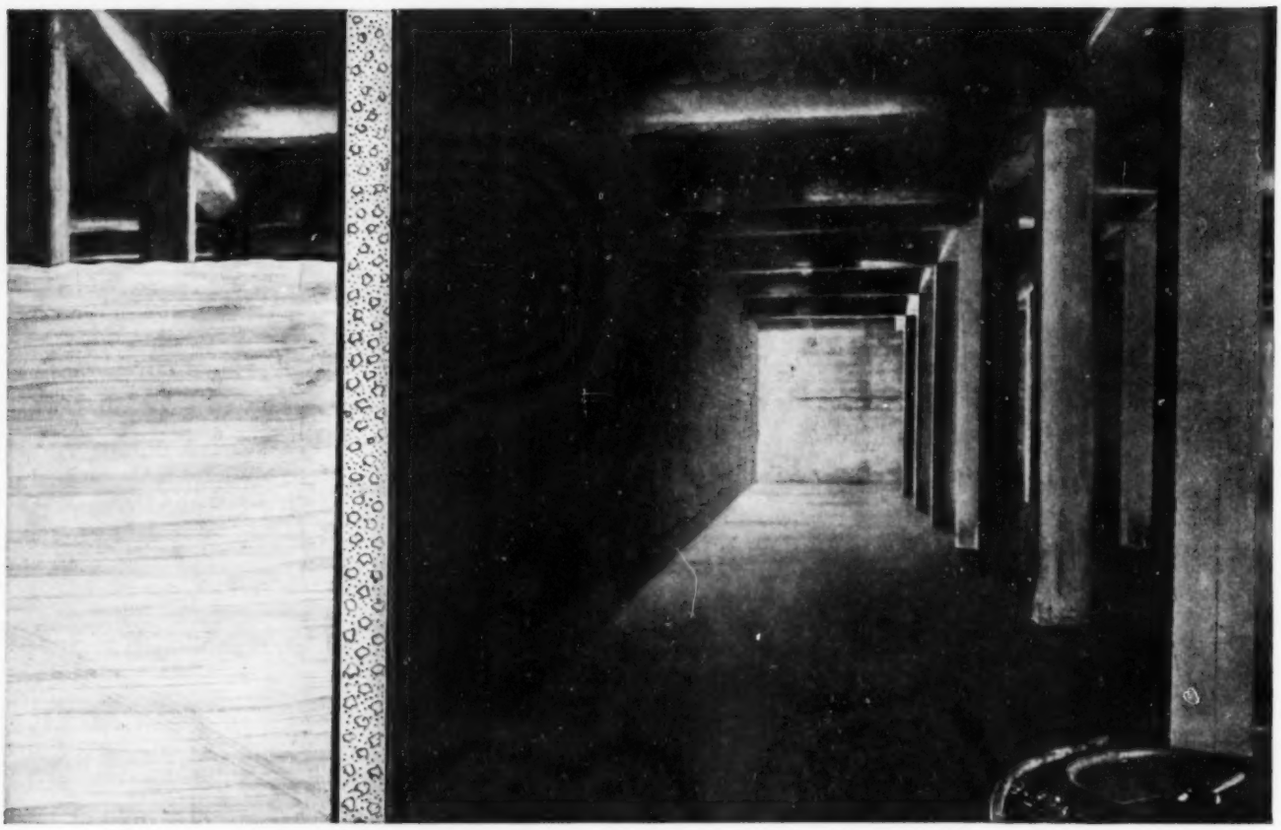

New reservoir at Kankakee, Illinois. Burnip Construction Co., Columbus, Ohio, contractor

A 12-foot head of water on one side, bone-dry on the other

In the new city reservoirs at Kankakee, Ill., the observance of the principles of modern concrete design insured more watertight concrete. The design for this concrete limited the amount of mixing water to seven gallons per sack of cement. Proper proportioning of local aggregates enabled the contractors to maintain a plastic, easy-to-place mix at all times. Collection of large quantities of water on the surface of the concrete during the placing operation was avoided and no laitance was permitted to form. After placing the concrete, the walls were kept damp to insure proper curing.

Such methods of mixing and placing do not increase costs. They result not only in increased watertightness but in stronger, more durable concrete as well. A booklet containing in detail these quality concreting methods and average results that may be expected with Universal or Atlas portland cement will be furnished on request.

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Without obligation, please send the booklet containing in detail quality concreting methods. A.R. 7-33

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THE ARCHITECTURAL RECORD

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VOLUME 70 JULY, 1931 NUMBER 1

Articles	Page
Two Shop Interiors *Percival Goodman, Inc., Architects*	3–6
Western Theological Seminary, Evanston, Illinois *Armstrong, Furst and Tilton, Architects*	7–12
A Week-End House and Studio *By V. M. S. Hannell, Designer and Owner*	33–36
Faculty Houses, Swarthmore College *By W. Pope Barney, Architect*	37–41
Stairways, Ramps, Escalators *By A. Lawrence Kocher and Albert Frey*	43–48
Apartments for the Average Wage-Earner	49, 50
Planning the Small Masonic Temple *By Carroll E. Welch, Architect*	51–53, 55
Lighting the Classroom *By H. L. Logan*	54, 55
New Devices for Household Use *By Gayne T. K. Norton*	60–66 (*adv.*)
Comment	
Create Suburban Neighborhoods *By Eugene H. Klaber, Architect*	42
Portfolio of Current Architecture	
House of John J. Herman, Orchard Park, N. Y. *Hudson and Hudson, Architects*	13, 14
House of Chauncey F. Hudson, Orchard Park, N. Y. *Hudson and Hudson, Architects*	15, 16
House of Raymond A. Willson, Piedmont, Calif. *Frederick H. Reimers, Architect*	17
Horseshoe Ranche, Dayton, Wyoming *Howard T. Fisher, Designer*	18, 19
Bullock's Wilshire Store, Los Angeles *Jock D. Peters, Designer*	20–26
Exhibition Room, Nirosta Products Association *Rodgers and Poor, Architects*	27
Feinberg & Price Shoe Shop, New York City *Walter F. March, Architect*	28, 29
Office Building, New York City *Thompson and Churchill, Architects*	30, 31
Technical News and Research	
Estimating the Cost of Small Houses *By Arthur Brace*	56–66
Building Trends and Outlook *By L. Seth Schnitman*	71, 72 56, 58 (*adv.*)
Publisher's Page	50 (*adv.*)
Architects' Announcements	49 (*adv.*)

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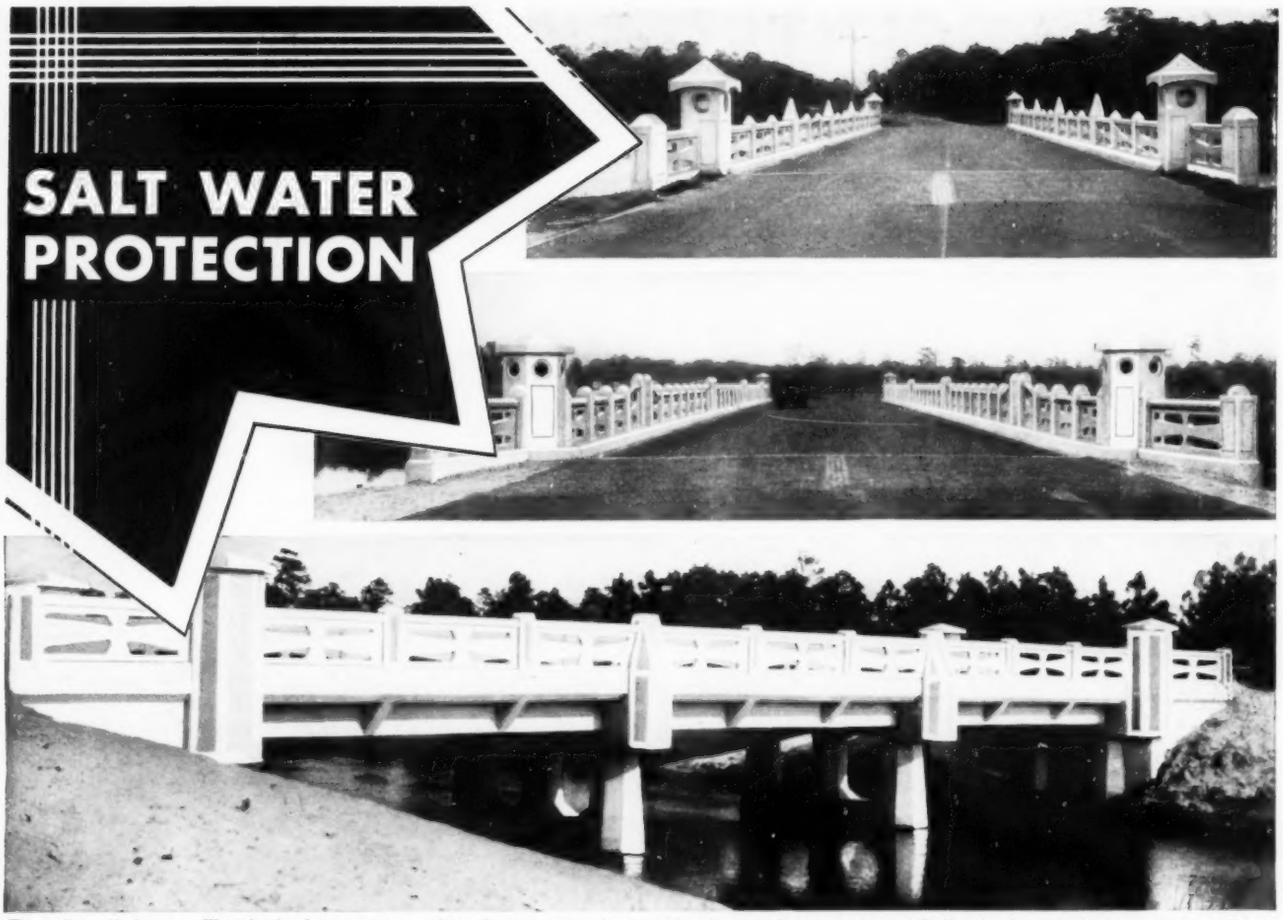
SALT WATER PROTECTION



Three Duvall County, Florida, bridges constructed by the county under specifications and supervision of T. Bright Carrick, Bridge and Consulting Engineer, Jacksonville, Florida. Concrete work is waterproofed with Truscon Waterproofing Paste (Integral).

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Concrete integrally waterproofed with Truscon Waterproofing Paste solved the difficult problem of finding a structural material for these bridges that would withstand alternate wetting and drying from salt water. Neither wood nor unwaterproofed concrete could be employed—the latter material disintegrating at tide level due to the absorption of salt water. Truscon Waterproofing Paste, by making the concrete impervious to moisture penetration, provided efficient and enduring construction. Note how the concrete has retained its uniform coloring due to the non-absorbent character imparted by Truscon protection. Here, as in fine structures throughout the world, Truscon Waterproofing Paste is demonstrating its outstanding value for protecting all types of concrete construction.

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(INTEGRAL)

ARCHITECTS' ANNOUNCEMENTS AND CALENDAR

Bartlett Cocke, architect, announces the dissolution of the partnership of Eickenroth and Cocke and the continuance of his practice with offices at 615 Maverick Building, San Antonio, Texas.

William H. Reid, Jr., announces the opening of an office for the general practice of architecture, 1106 Union and People's National Bank Building, Jackson, Michigan.

Donaldson and Meier, architects, announce the removal of their offices from 1188 First National Bank Building to 1601 Washington Boulevard Building, Detroit, Michigan.

E. Dean Parmelee, architect, has moved his office from 260 North Avenue, New Rochelle, to the People's National Bank Building, 31 Mamaroneck Avenue, White Plains, New York.

A. F. Wysong and T. P. Jones, formerly of the firm of Wysong, Bengtson and Jones, Charleston, West Virginia, announce their association with Russell Seymour, Jacksonville, Florida, for the practice of architecture under the firm name of Wysong, Seymour and Jones with offices in the Schmidt Building, Cincinnati, Ohio, and People's Bank Building, Charleston, West Virginia.

CALENDAR OF EVENTS

July 5-Sept. 5	Summer course in Italian Architecture, Rome, Italy. Apply to Italian Tourist Information Office, 745 Fifth Avenue, New York City.
July 10-Aug. 30	Vacation-study tour of housing, arranged and directed by The Garden Cities and Town Planning Association, London, in cooperation with the City Affairs Committee, 112 East 19th Street, New York City. For information, address Helen Alfred, Housing Chairman.
July 16-Aug. 26	Second Annual American Fair, Atlantic City Auditorium.
Until August	Art Exhibition, Royal Scottish Academy, Edinburgh.
Until Aug. 2	German Building Exhibition, in connection with International Town Planning and Housing Exhibition, Berlin.
May 4-Aug. 8	Art Exhibition, Royal Academy, London (Burlington House).
October 1	Closing date for entries for Lincoln Arc Welding Prize competition. Address inquiries to the Lincoln Electric Company, Cleveland, Ohio.
October 15	Closing date for entrie. to 5th Annual Small House Competition. Address the House Beautiful, 8 Arlington Street, Boston.
November	Exposition of Indian Tribal Arts, Grand Central Art Galleries.
October-December	Art Exhibition, Royal Society of Painters in Water Colours, London (5a, Pall Mall East).
December 1	Closing date for entries in 1931 Better Homes in America Competition. Address Better Homes in America, 1653 Pennsylvania Ave., Washington, D. C.

PRIX DE ROME

This architectural prize has been awarded to Henry D. Mirick of Washington, student at the University of Pennsylvania. The same prize, for landscape architecture, went to Neil Hamill Park of Parkin, Ark., who studied at Cornell. Both awards carry stipends of about $5,000, providing for two years' study at the American Academy in Rome, sponsor of the awards.

Mr. Mirick won with a modified classical design for an officers' club in the capital of an important island territory in the tropics.

Eighty-eight competitors entered the preliminary competition for architecture and thirty-one in landscape architecture. Five in each class were chosen for the finals. Members of the juries that decided the awards were William Mitchell Kendall, Chester H. Aldrich, Louis Ayres, Charles A. Platt and James K. Smith for architecture, and Gilmore D. Clarke, Noel Chamberlin, Percival Gallagher, Ralph E. Griswold and Fletcher Steele, for landscape architecture.

BRIDGE DESIGN AWARDS

For the design of a steel bridge, the American Institute of Steel Construction has awarded five prizes totaling $1,200. The prize winners were selected from some 150 students of engineering and of architecture in the various colleges and universities of the United States and Canada.

The first prize of $500 for the best design by a student of architecture went to R. F. Weber of Atelier Adams Nelson, Chicago. The second prize of $250 was awarded to Glenn E. Crippen of Iowa State College, and the third prize of $100 went to Lester W. Casey of Iowa State College.

The jury decided to withhold the first prize to the group that contested for the best design by an engineering student. The second prize in this group for $250 was awarded to Jeremiah C. Iandolo of the University of Pennsylvania, and the third prize of $100 went to Covert Robertson of the University of Michigan.

WATER TANK DESIGN AWARDS

The Chicago Bridge and Iron Works announces the following prize winners in the international competition to develop "aesthetic improvement" in the design of water tanks.

First prize of $2,000 to Eugene Voita, Chicago; second prize of $1,000 to F. D. Chapman and C. M. Goldman, associated, Evanston, Ill.; third prize of $500 to Howard W. Voder, Chicago.

Honorable mentions, carrying a prize of $100 each, were awarded to the following: Donald A. Blake, Chicago; George A. Hossack, Chicago; Ossip Klarwein and Fritz Hoger, Hamburg, Germany; Mary Ann E. Crawford, Chicago; Samuel E. Homsey, Cambridge, Mass.

Vandamm Studio

CAPE PLAYHOUSE CINEMA, DENNIS, MASS.
RODGERS AND POOR, ARCHITECTS

IN THE AUGUST ISSUE

Beach developments, swimming pools, dressing rooms, week-end houses are featured in a portfolio devoted to architectural developments for the out-of-doors.

There has been a tremendous increase in the playing of court games. Squash racquets is now the most popular winter sport at many men's colleges, athletic clubs, and Y. M. C. A.'s. The study of Squash Court Planning was prepared by Howard T. Fisher with cooperation from the United States Squash Association.

Two small suburban theaters are illustrated and described in the August issue, one a community playhouse at Dennis, Massachusetts, by Rodgers and Poor, the other a town theater at Southampton, Long Island, by Paul Ruehl.

New Fields for the Architect is the subject of Technical News and Research. There are illustrations and drawings of minor architecture such as news stands, gas stations, shelters, band stands, roadside stands, which should receive the consideration of architects.

There will again be a selection of houses of low-cost suited to suburban building development.

Galloway

PLAYLAND POOL, RYE BEACH

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The architect has a real opportunity today to combine beauty with practicability in designing structures of the commercial or institutional type.

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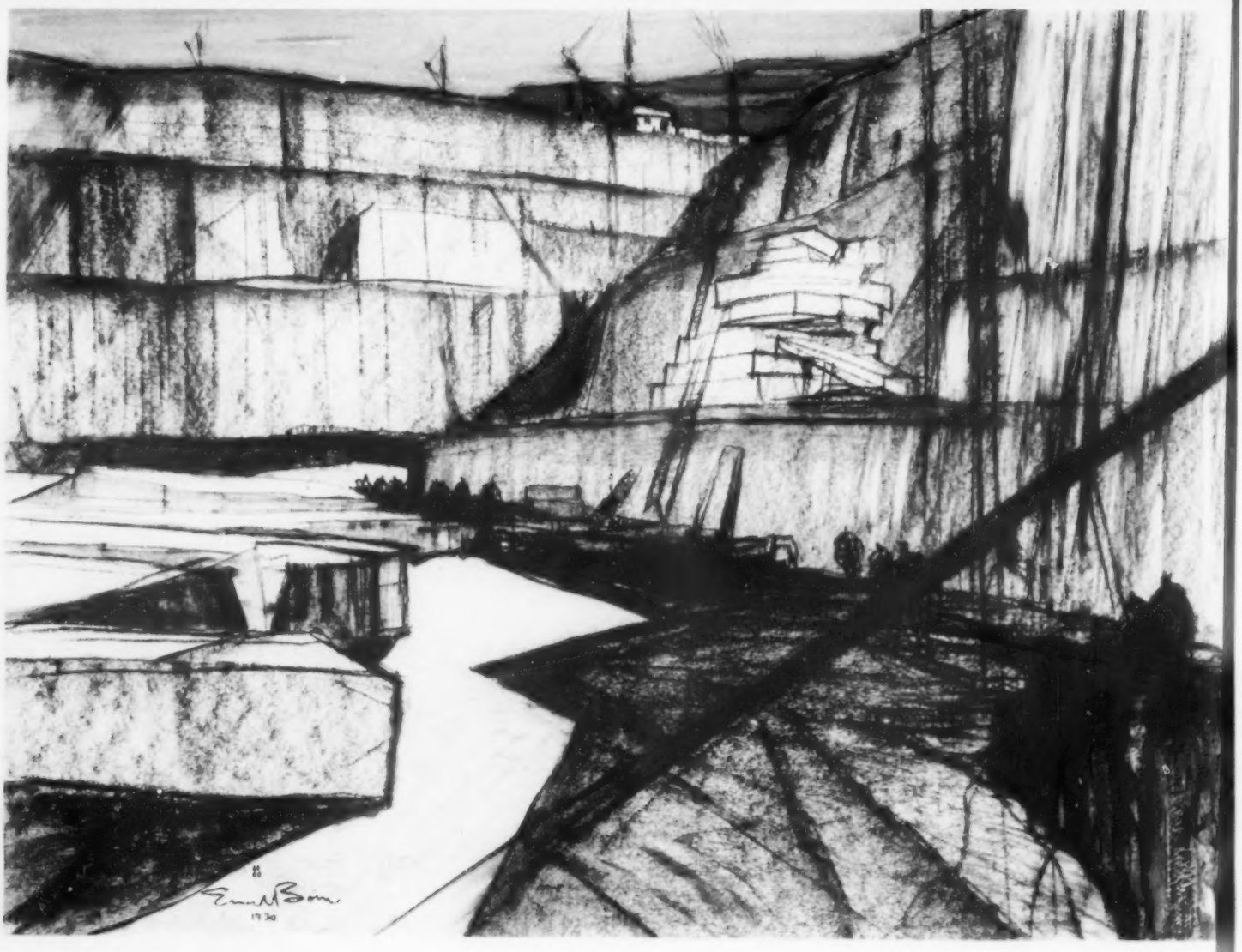

ON THE QUARRY FLOOR

Number Eight of a series of twelve drawings made at the Fletcher Quarries by Ernest Born.

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SHOE SHOP FOR SOMMERS, INC.
2 WEST 57TH STREET, NEW YORK CITY
PERCIVAL GOODMAN, INC., ARCHITECTS

THE ARCHITECTURAL RECORD

AN ILLUSTRATED MONTHLY MAGAZINE
OF ARCHITECTURE

VOLUME 70 JULY · 1931 NUMBER 1

TWO SHOP INTERIORS

PERCIVAL GOODMAN, INC., ARCHITECTS

BONWIT TELLER SHOP
PALM BEACH, FLORIDA

This shop, as the plan on page 6 shows, is irregular in shape. Shop windows are on two sides. These are opened directly to the street for three reasons:

(1) To provide a maximum of daylight and ventilation.

(2) To increase the size of the store.

(3) To permit passers-by to see the interior of the shop by day and also by night, since it was the owner's intention to keep the shop fully illuminated until midnight.

The materials used in this store are ebony and Avoidire for woods, and plaster, painted a pale yellow, for the walls. The columns and displays are covered with carved green mirrors.

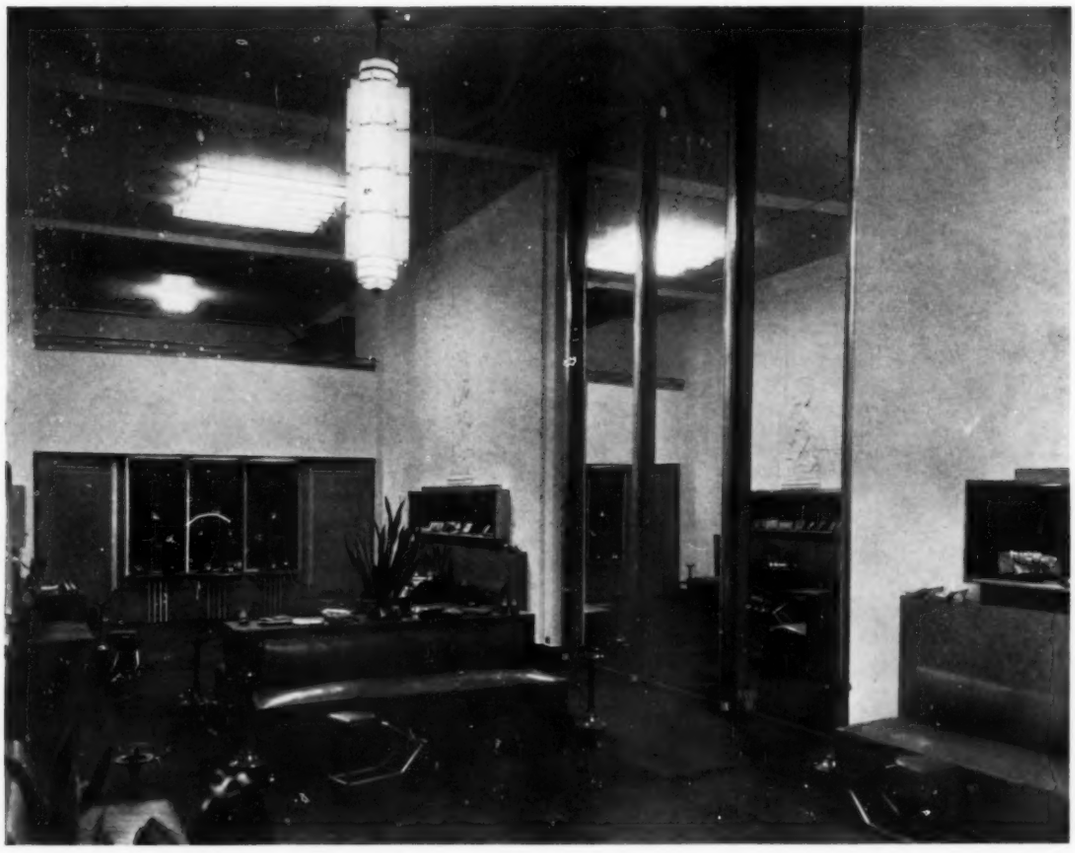
The carpet is brown and the rugs are in tones of brilliant green. Hangings are green and yellow prints. The metal furniture is upholstered in orange.

SHOE SHOP FOR SOMMERS, INC.
2 WEST 57th STREET, NEW YORK CITY

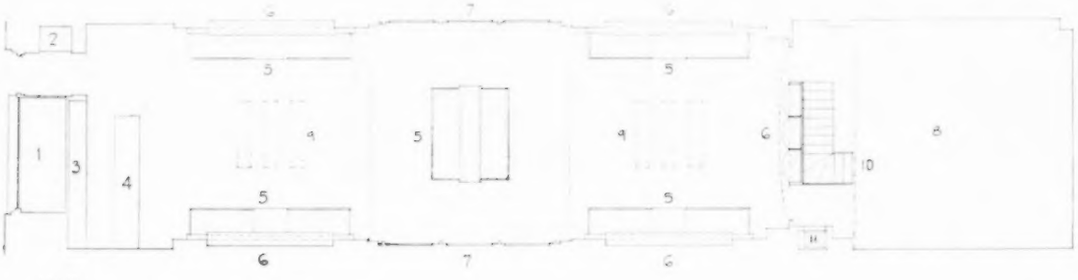
The walls of this store are treated architecturally to form three bays. The middle bay has three mirrors extending from floor to ceiling and separated by metal columns. The other two bays have built-in display cases and a seating arrangement.

The materials used are two types of wood: Padouk Burl and Orientalwood, in orange, brown, and dark brown. The walls are in plaster with a bas-relief designed by the architects, and are painted a cool yellow. All metal trim is yellow brass.

The display cases are lined with carved green mirrors. Upholstery of seating is in leather. Both the upholstery and carpet are in a brilliant green.



Leather upholstery and carpet are in a brilliant green. Yellow plaster walls with a bas-relief designed by the architects



SHOE SHOP FOR SOMMERS, INC.
2 WEST 57th STREET, NEW YORK CITY
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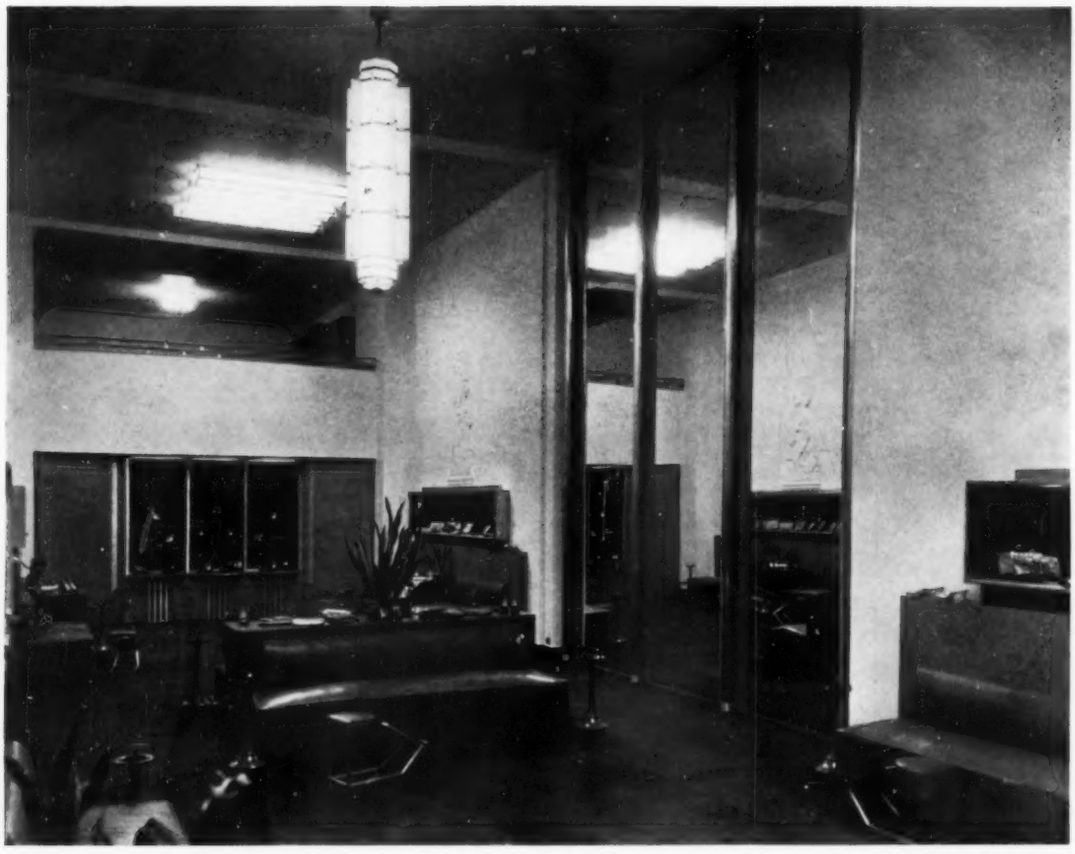

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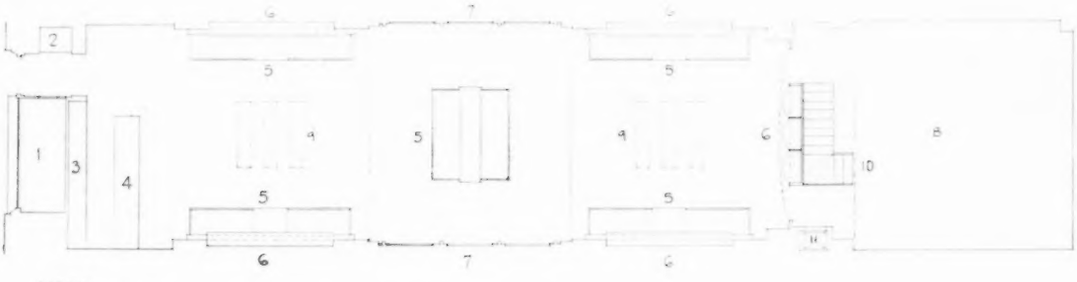

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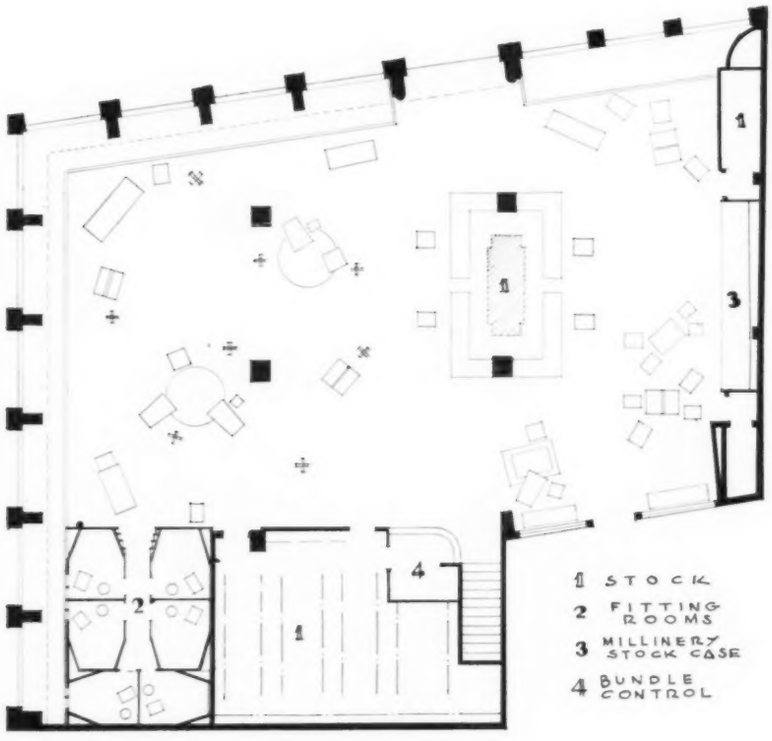

BONWIT TELLER SHOP
PALM BEACH, FLORIDA
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Trowbridge

HORLICK TOWER AND REFECTORY

WESTERN THEOLOGICAL SEMINARY

EVANSTON, ILLINOIS

ARMSTRONG, FURST AND TILTON, ARCHITECTS

The Western Theological Seminary was founded in 1883. For about forty years it occupied a site on West Washington Boulevard, Chicago. The removal to Evanston was brought about by an offer from Northwestern University of a site near the University, and an arrangement whereby Seminary students might use the facilities and library of the University.

The new buildings have been planned in two groups. The one to the east includes the chapel, the administration offices, classrooms, and libraries. The group to the west includes the dormitories with a refectory in the west wing and a commons room at the front of the F. A. Junkin Dormitory. The style of the buildings is thirteenth century Gothic.

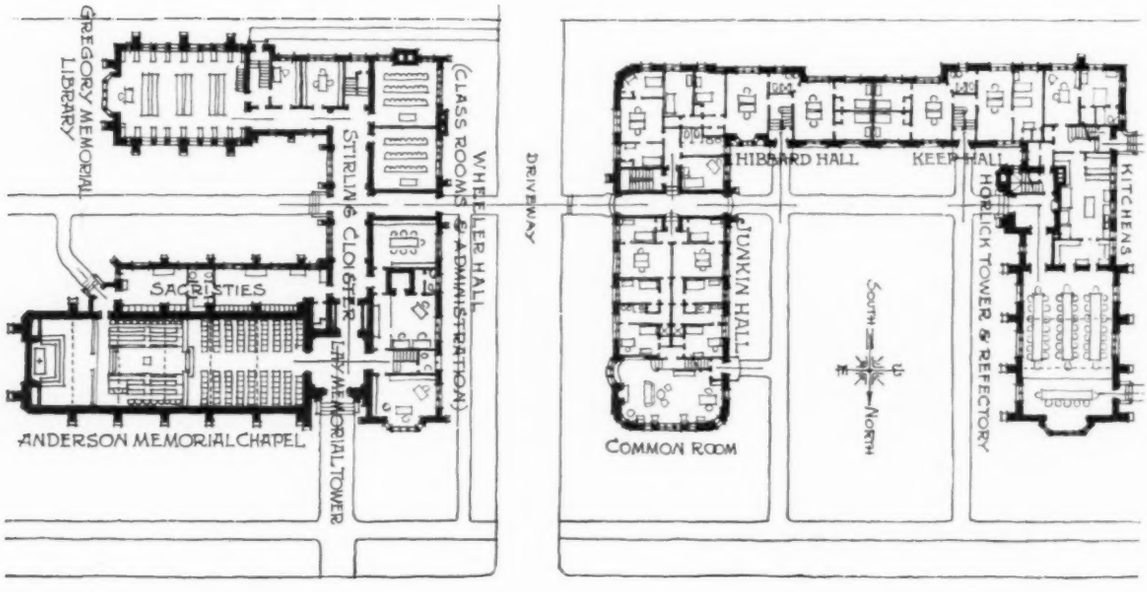
Living quarters have been provided for about fifty students. The chapel, which is a memorial to the late Bishop Charles Palmerton Anderson, and also his burial place, seats about one hundred and fifty persons. The libraries house about fifty thousand volumes.

The exterior materials consist of Wisconsin limestone varying in color from a soft warm gray to rust, while the trim is of rustic buff Bedford stone with tool marks showing. The roofs are covered with slate blended in color and shading from eaves to ridge. The floor in the chapel is of stone. The roof is of wood with exposed trusses which are decorated in color. The floors in principal corridors and rooms are of tile and slate. All floors in schoolrooms and dormitories are covered with mastic tile.

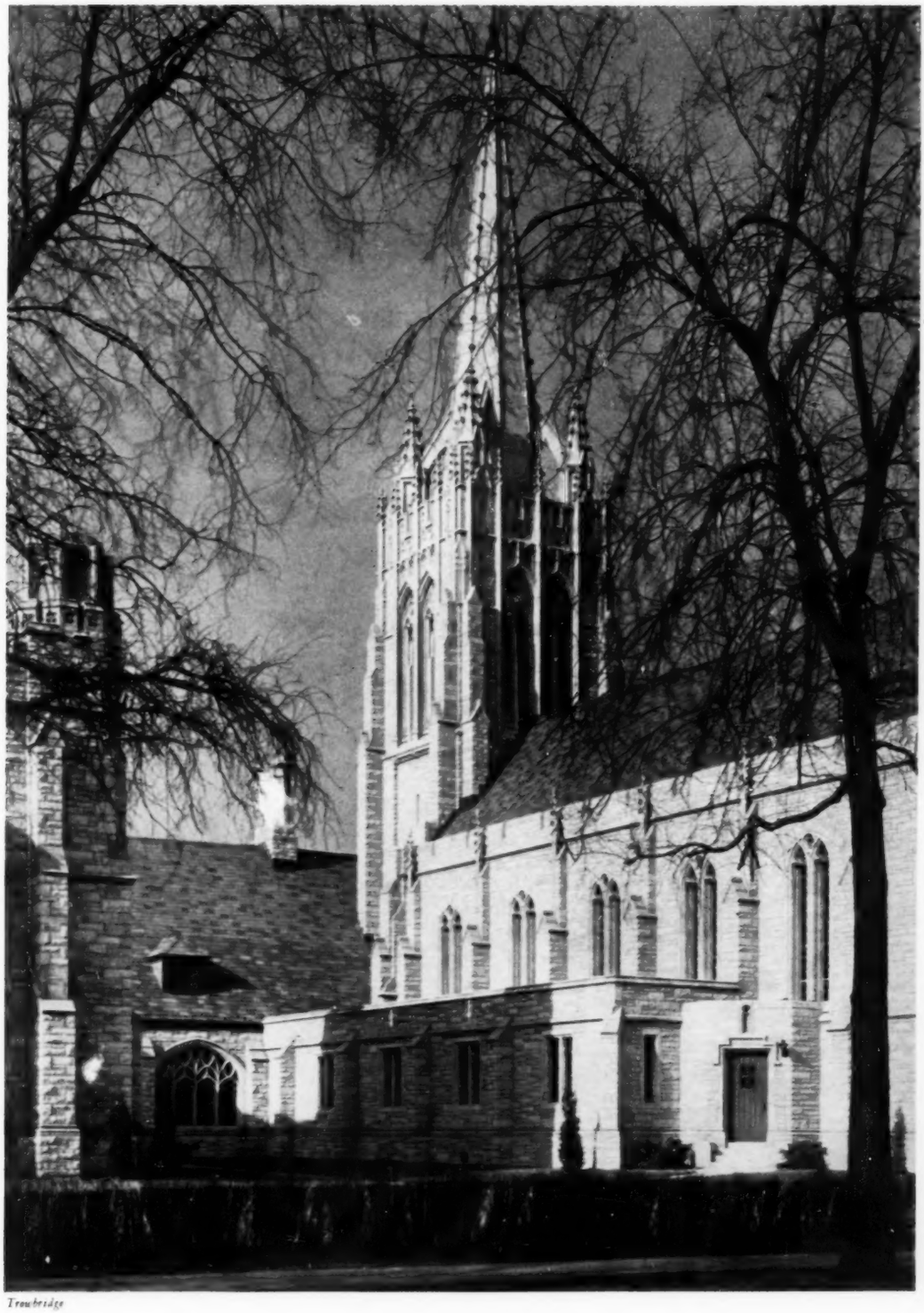
The cost of the various buildings in the two groups was about 80c a cubic foot, in total amounting to about $630,000.

Troubridge

VIEW OF ENTIRE GROUP FROM NORTHEAST



GROUND FLOOR PLAN
WESTERN THEOLOGICAL SEMINARY, EVANSTON, ILLINOIS
ARMSTRONG, FURST AND TILTON, ARCHITECTS



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CHAPEL AND CLOISTER
WESTERN THEOLOGICAL SEMINARY, EVANSTON, ILLINOIS
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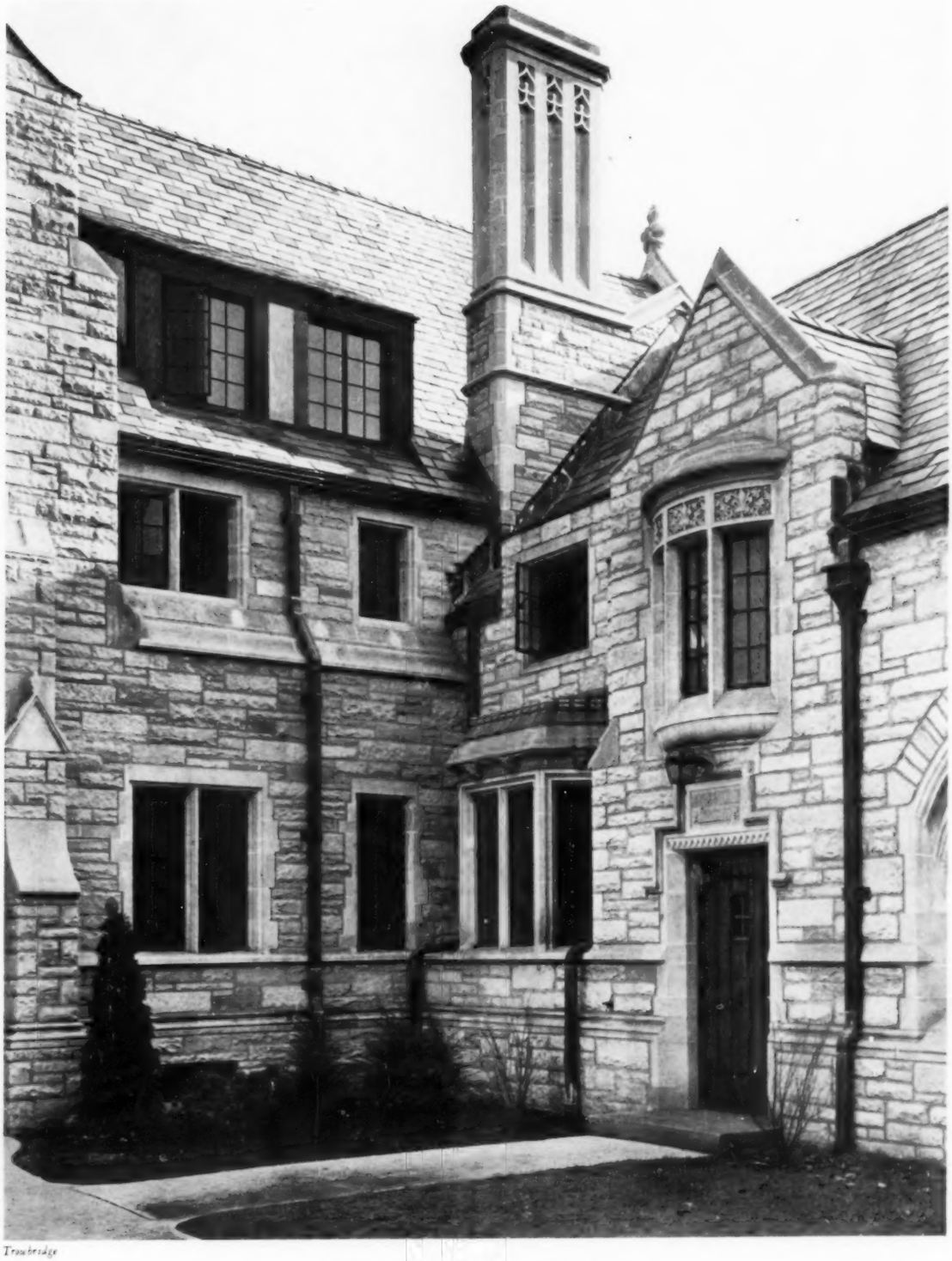

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JUNKIN AND HIBBARD DORMITORIES
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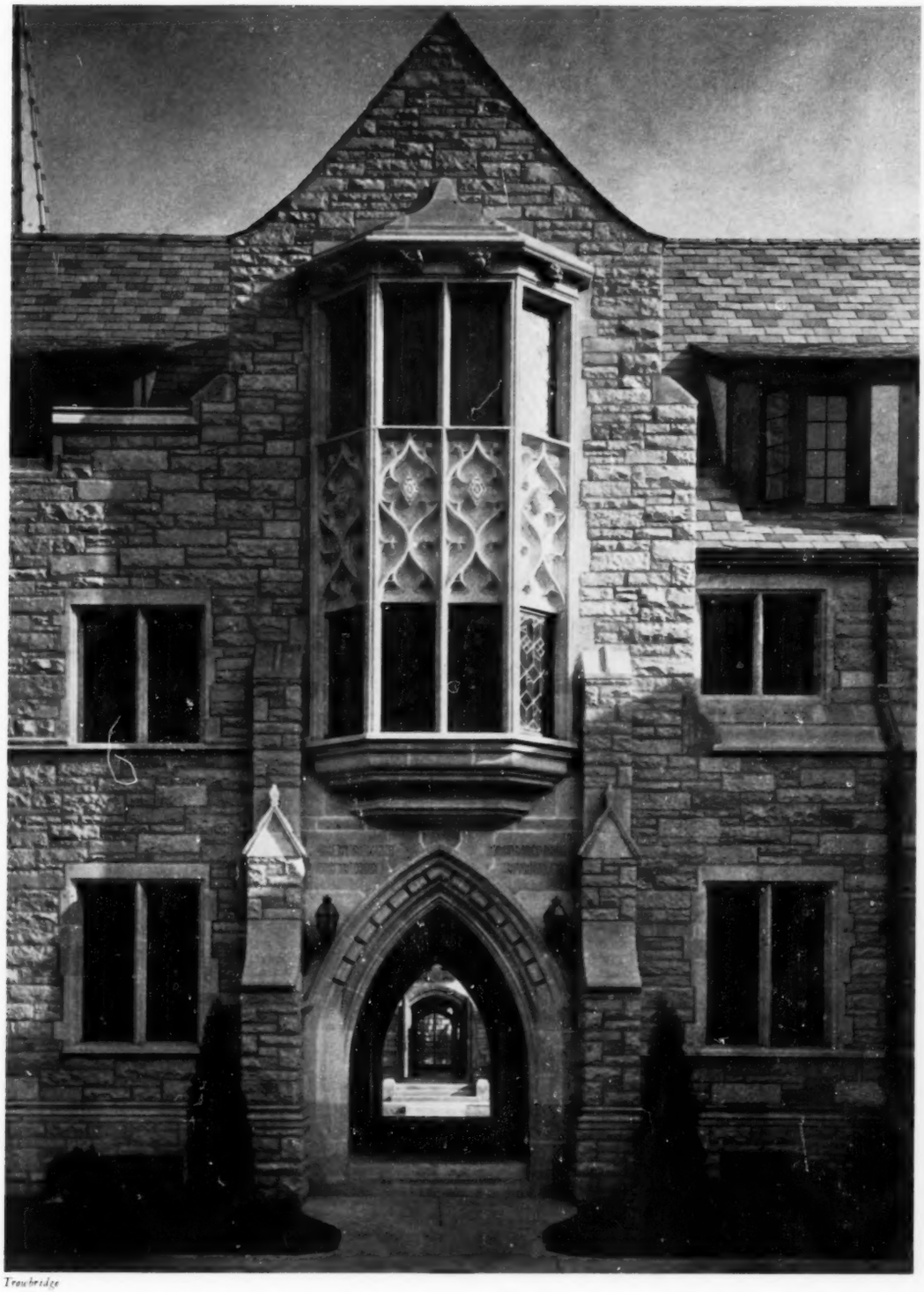
ARMSTRONG, FURST AND TILTON, ARCHITECTS



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JUNKIN DORMITORY ENTRANCE TO ADMINISTRATION UNIT
WESTERN THEOLOGICAL SEMINARY, EVANSTON, ILLINOIS
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ENTRANCE TO REFECTORY
WESTERN THEOLOGICAL SEMINARY, EVANSTON, ILLINOIS
ARMSTRONG, FURST AND TILSON, ARCHITECTS

PORTFOLIO
OF
CURRENT ARCHITECTURE

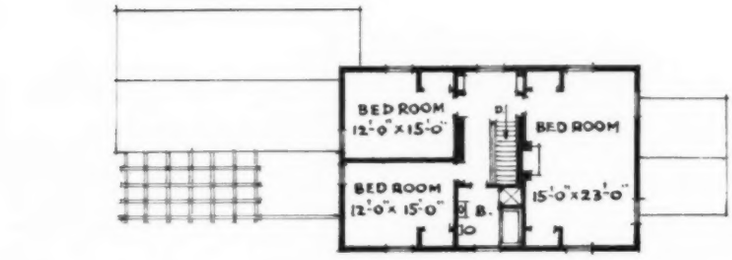
Inskip

HOUSE OF JOHN J. HERMAN, ORCHARD PARK, N. Y.
HUDSON AND HUDSON, ARCHITECTS

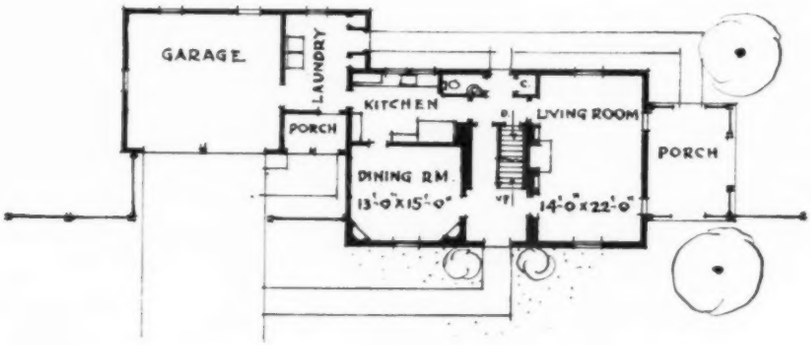
FEATURING

HOUSES, SHOP INTERIORS,
A SHOE STORE, AN EXHIBITION ROOM,
AN OFFICE BUILDING

HOUSE OF JOHN J. HERMAN
ORCHARD PARK, NEW YORK
HUDSON AND HUDSON, ARCHITECTS

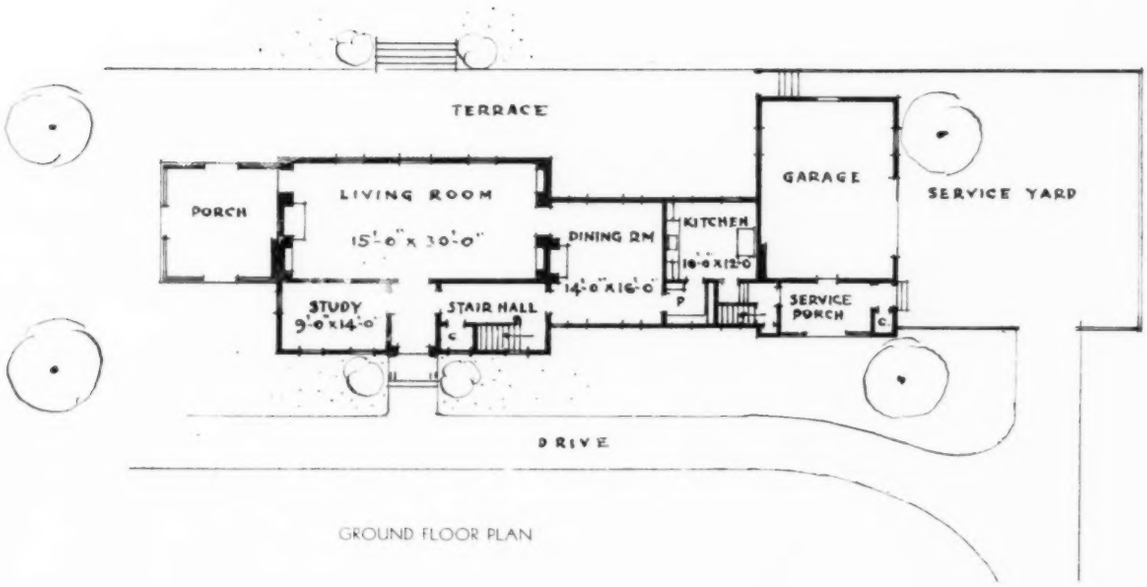


SECOND FLOOR



GROUND FLOOR

HOUSE OF CHAUNCEY F. HUDSON
ORCHARD PARK, NEW YORK
HUDSON AND HUDSON, ARCHITECTS



GROUND FLOOR PLAN

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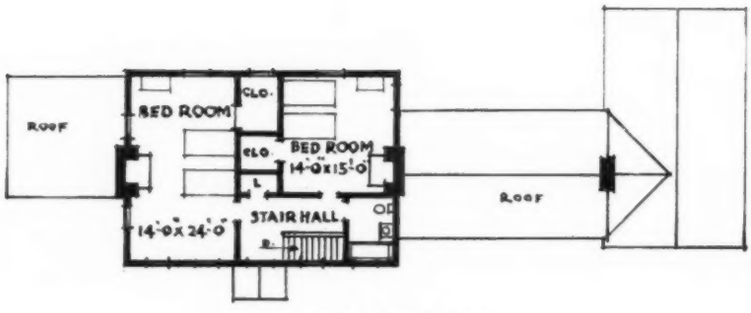
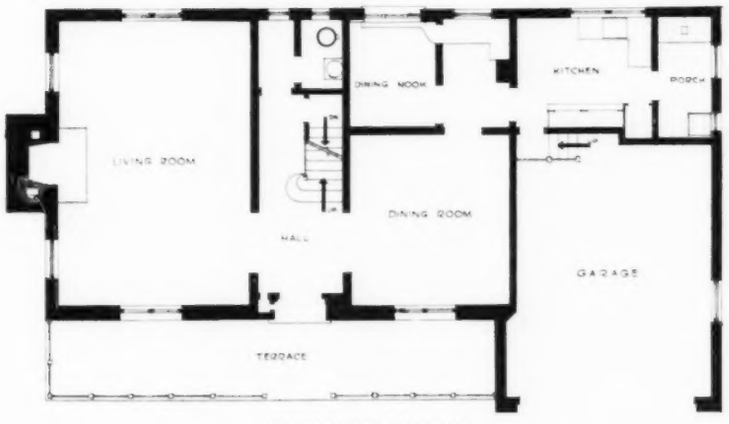
HOUSE OF CHAUNCEY F. HUDSON
ORCHARD PARK, NEW YORK
HUDSON AND HUDSON, ARCHITECTS



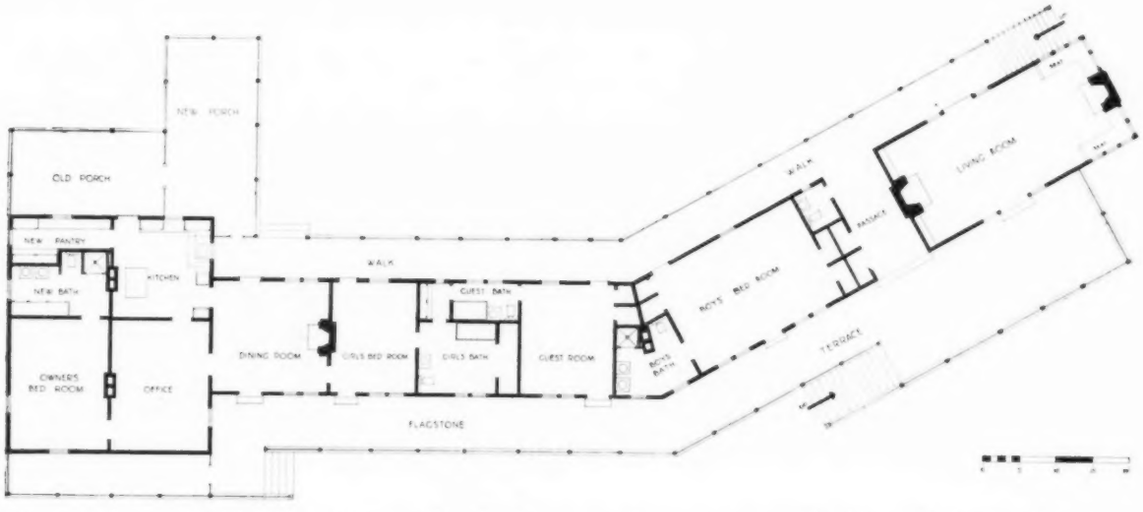
SECOND FLOOR PLAN

HOUSE OF RAYMOND A. WILLSON
PIEDMONT, CALIFORNIA
FREDERICK H. REIMERS, ARCHITECT



GROUND FLOOR PLAN

Hedrich-Blessing



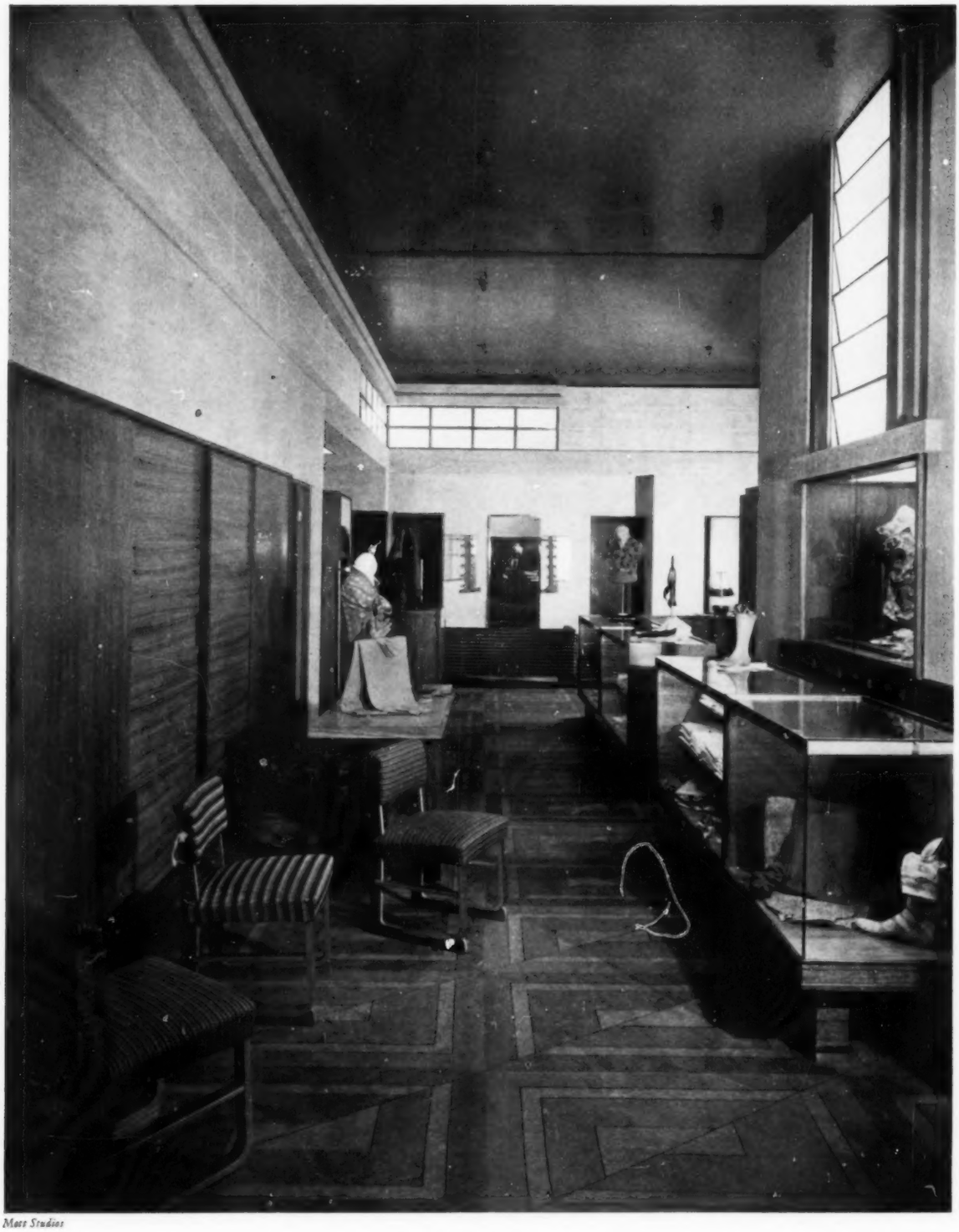
The ranchhouse is built on a ridge and bends along a small mountain stream below. Each room has cross ventilation.

HORSESHOE RANCHE, DAYTON, WYOMING
HOWARD T. FISHER, DESIGNER

Hedrich-Blessing

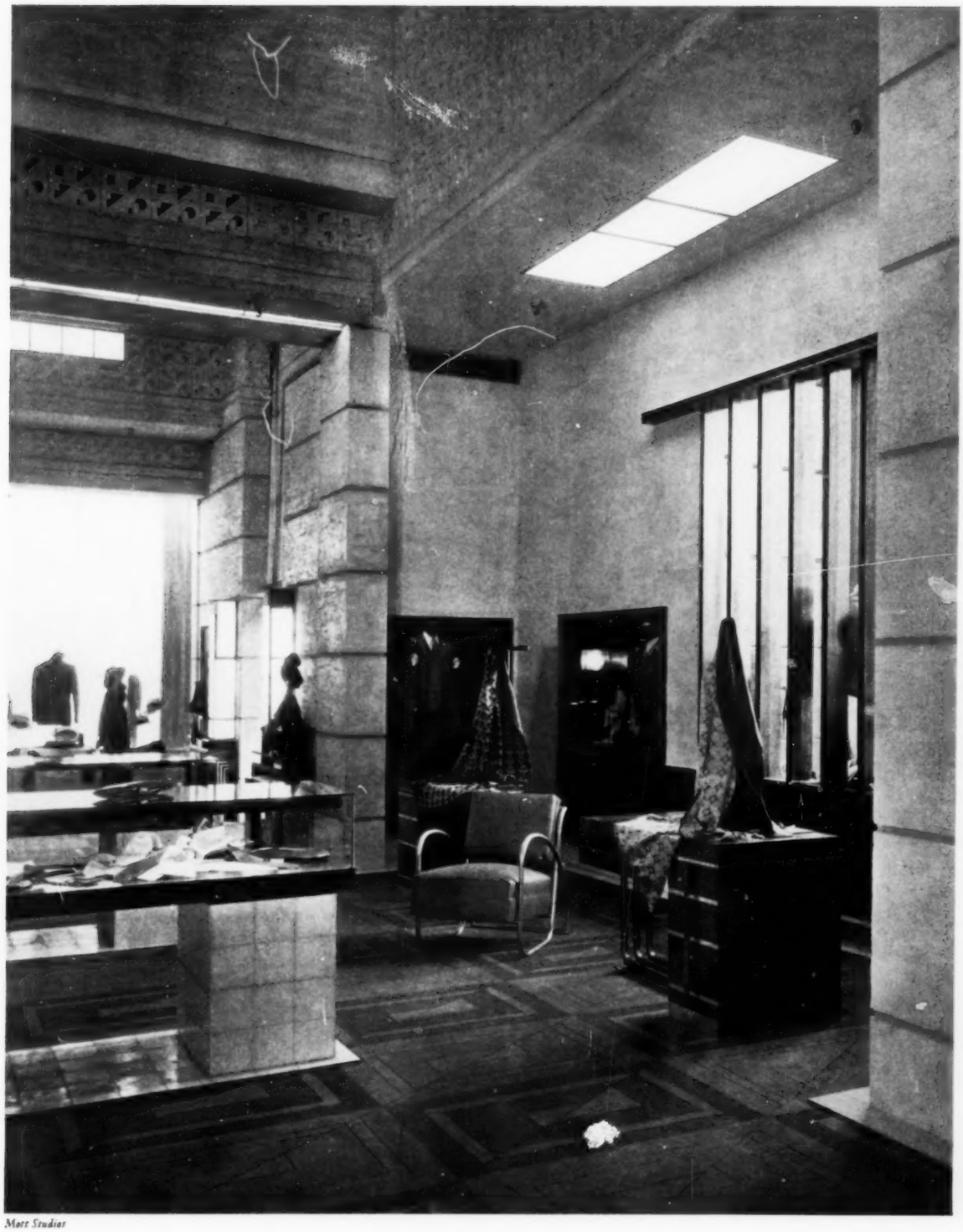
A 3-car garage is provided under the terrace. The house is intended primarily for summer occupancy; heating is by fireplaces and small stoves.

HORSESHOE RANCHE, DAYTON, WYOMING
HOWARD T. FISHER, DESIGNER



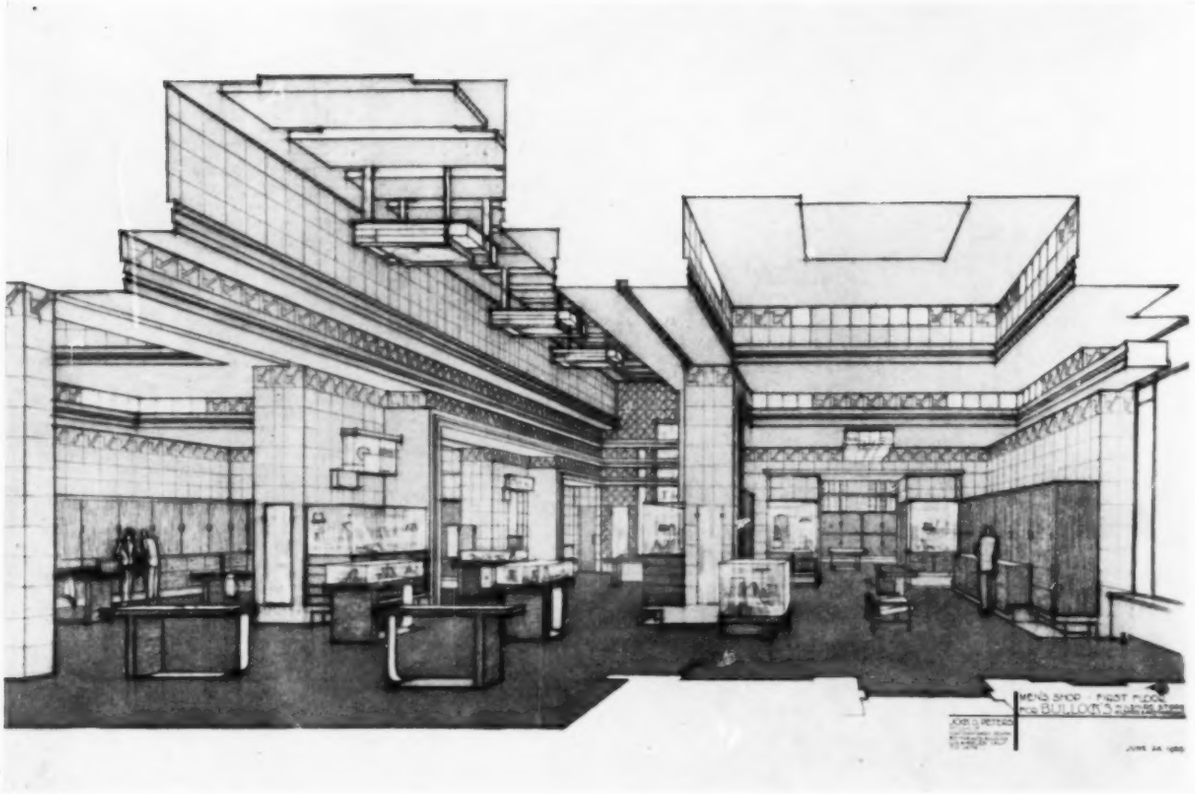
Mott Studios

BOYS' SHOP
BULLOCK'S WILSHIRE STORE, LOS ANGELES
JOCK D. PETERS, DESIGNER



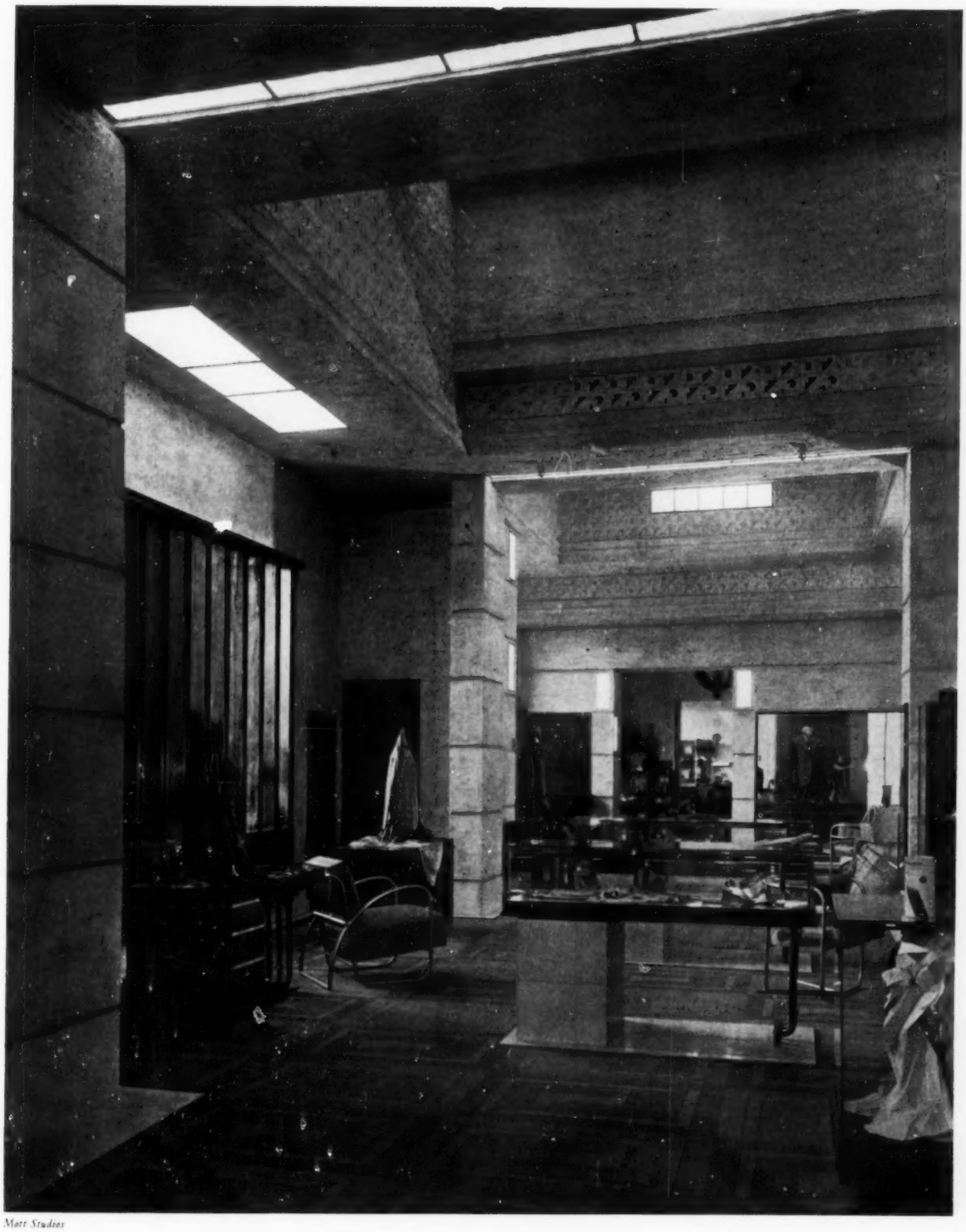
Mott Studios

CORNER OF MEN'S SHOP
BULLOCK'S WILSHIRE STORE, LOS ANGELES
JOCK D. PETERS, DESIGNER



Matt Studios

SECTION SHOWING
MEN'S SHOP
BULLOCK'S WILSHIRE STORE, LOS ANGELES
JOCK D. PETERS, DESIGNER



Matt Studios

MEN'S SHOP
BULLOCK'S WILSHIRE STORE, LOS ANGELES
JOCK D. PETERS, DESIGNER

Mott Studios

DETAIL OF MEN'S SHOP
BULLOCK'S WILSHIRE STORE, LOS ANGELES
JOCK D. PETERS, DESIGNER

Matt Studios

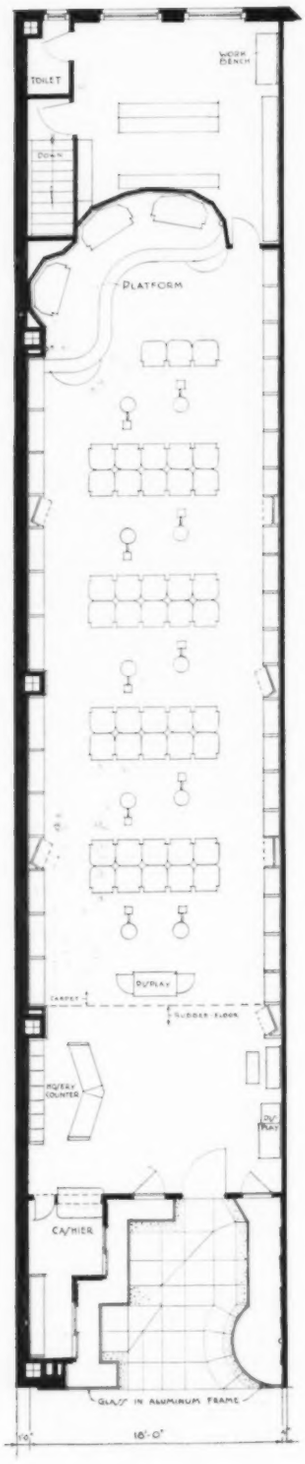
SHOE SECTION OF MEN'S SHOP
BULLOCK'S WILSHIRE STORE, LOS ANGELES
JOCK D. PETERS, DESIGNER

Matt Studios

ETCHING DEPARTMENT
BULLOCK'S WILSHIRE STORE, LOS ANGELES
JOCK D. PETERS, DESIGNER

Van Anda

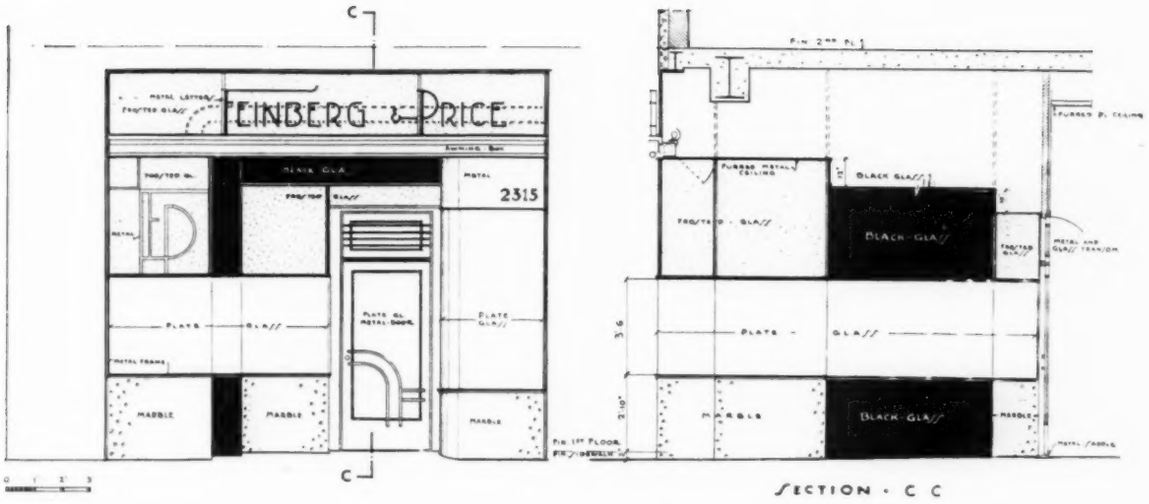
EXHIBITION ROOM
NIROSTA PRODUCTS ASSOCIATION
RODGERS AND POOR, ARCHITECTS



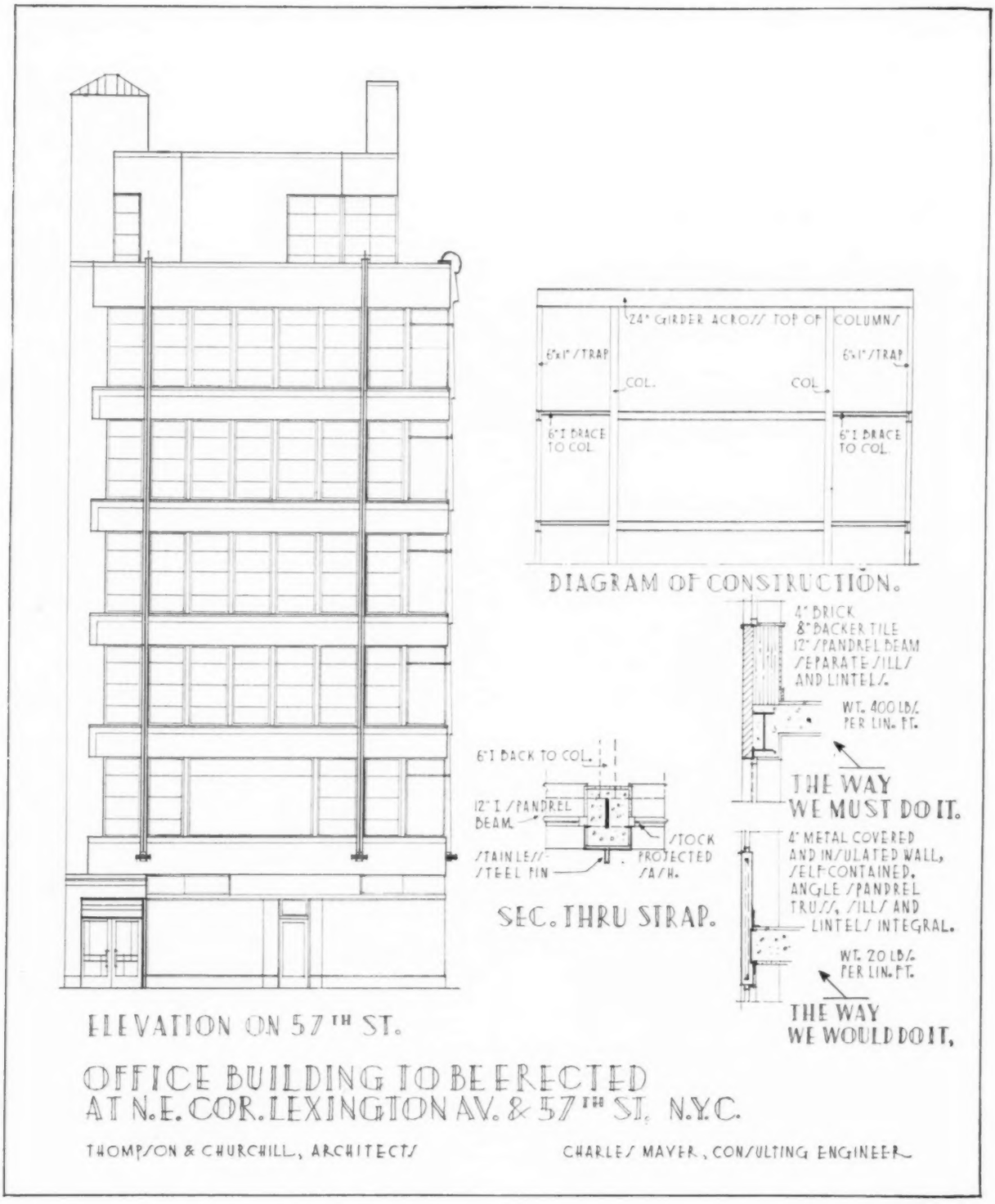
Seating capacity: 49. All woodwork in satinwood and walnut. Plaster walls and ceiling in aluminum paint; white panel in center. Gray carpet. Indirect lighting above shelving.

FEINBERG & PRICE SHOE SHOP
NEW YORK CITY
WALTER F. MARCH, ARCHITECT

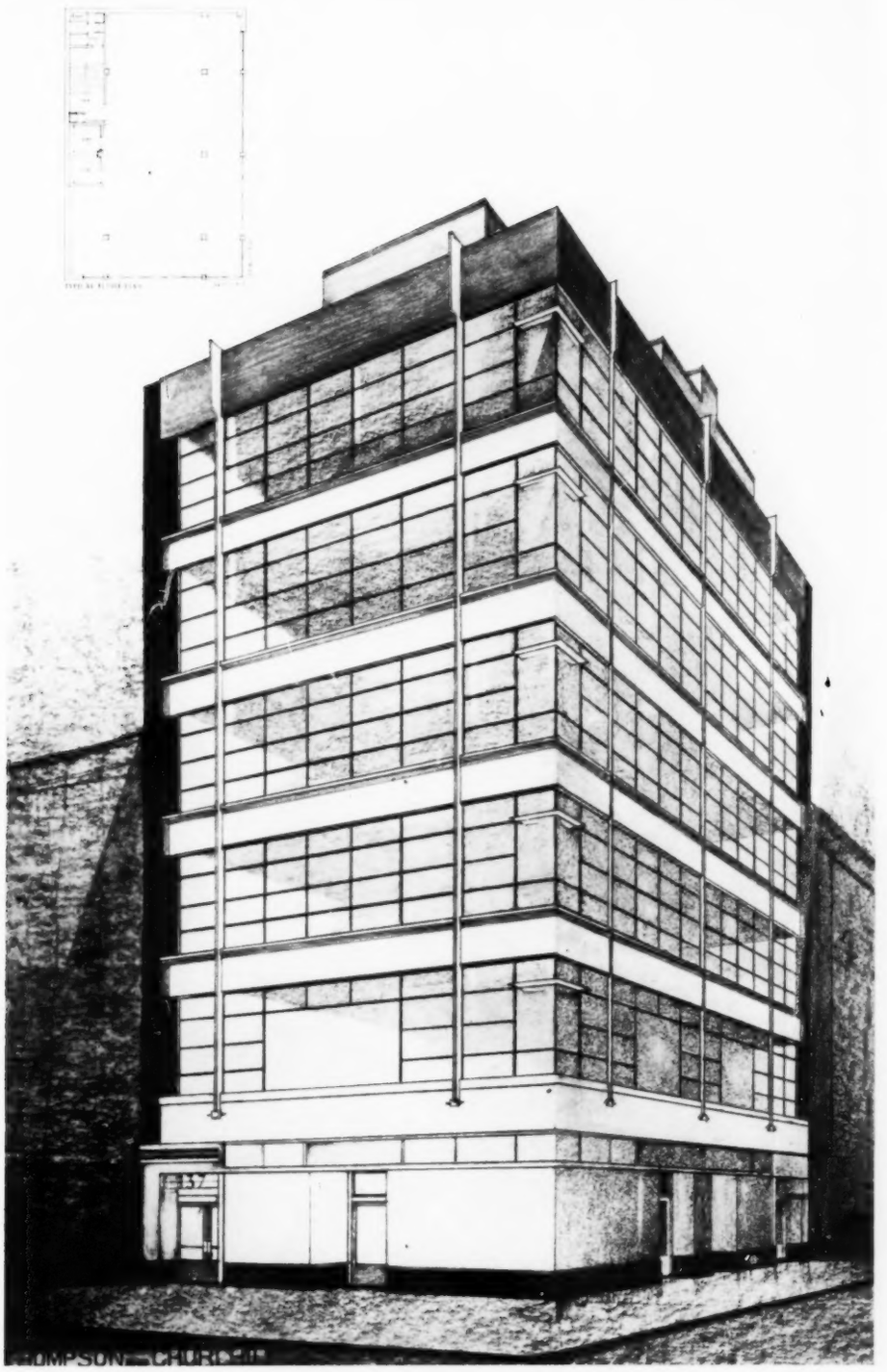
Peyser and Pazzis



FEINBERG & PRICE SHOE SHOP
NEW YORK CITY
WALTER F. MARCH, ARCHITECT


24" GIRDER ACROSS TOP OF COLUMNS
6"x1" STRAP
6"x1" STRAP
COL.
COL.
6" I BRACE TO COL.
6" I BRACE TO COL.
DIAGRAM OF CONSTRUCTION.
4" BRICK
8" BACKER TILE
12" SPANDREL BEAM
SEPARATE SILL
AND LINTEL.
WT. 400 LBS. PER LIN. FT.
THE WAY WE MUST DO IT.
6" I BACK TO COL.
12" I SPANDREL BEAM.
STAINLESS STEEL PIN
STOCK PROJECTED SASH.
SEC. THRU STRAP.
4" METAL COVERED AND INSULATED WALL, SELF-CONTAINED. ANGLE SPANDREL TRUSS, SILL AND LINTEL INTEGRAL.
WT. 20 LBS. PER LIN. FT.
THE WAY WE WOULD DO IT.
ELEVATION ON 57TH ST.
OFFICE BUILDING TO BE ERECTED
AT N.E. COR. LEXINGTON AV. & 57TH ST. N.Y.C.
THOMPSON & CHURCHILL, ARCHITECTS
CHARLES MAYER, CONSULTING ENGINEER

Construction of this office building is now under way.



RENDERING OF OFFICE BUILDING
NEW YORK CITY
THOMPSON AND CHURCHILL, ARCHITECTS

Shoji Ozato

WEEK-END HOUSE AT FURNESSVILLE, INDIANA
DESIGNED BY V. M. S. HANNELL, OWNER

Shaw Estate

A WEEK-END HOUSE AND STUDIO

By V. M. S. HANNELL, Designer and Owner

The house is on the crest of a hill in an oak wood and has a wide view of the surrounding dunes.

Framing was built according to U. S. Bureau of Standards recommendations. The exterior is vertically laid common 6-in. fir flooring on ship-lap with building paper between, and stained.

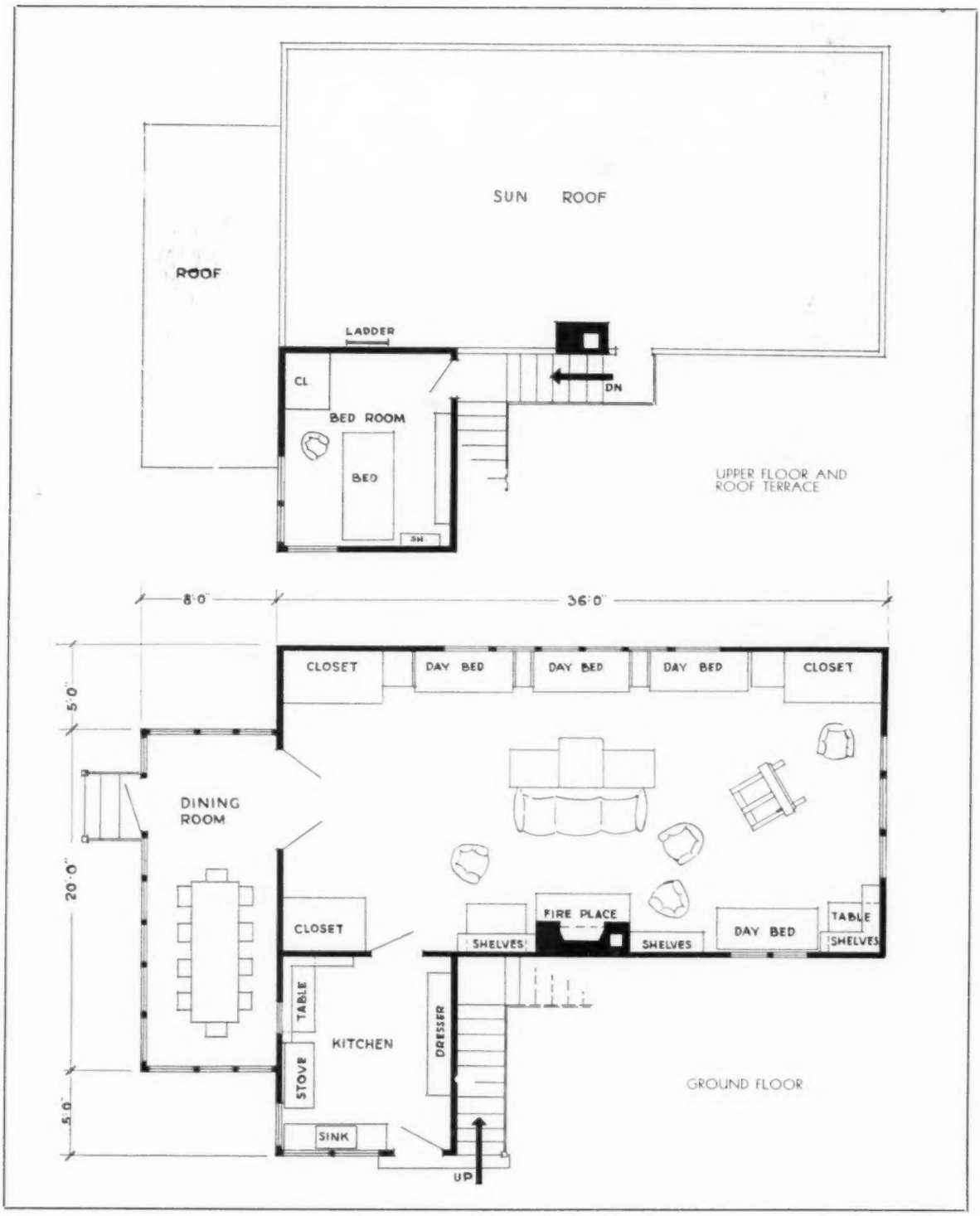
The windows are common four-light barn sash, swinging out. The large north window has six single lights set stationary.

The steps to the house are built of 4-in. fir laid edgewise with a space between each board; each step thus acts as a foot scraper.

There are no interior stairs. The entrance to the small second floor bed chamber is off the landing of the stair leading to the roof. The roof terrace will eventually be partly screened.

The interior is finished with Celotex. Large built-in storage closets of Celotex reach halfway to the 12-foot ceiling.

The large screened-in dining porch will be completely glassed in for use in cool weather. A serving window from the kitchen to the porch is very convenient.



WEEK-END HOUSE AT FURNESSVILLE, INDIANA
DESIGNED BY V. M. S. HANNELL, OWNER

Shoji Otaki

WEEK-END HOUSE AT FURNESSVILLE, INDIANA
DESIGNED BY V. M. S. HANNELL, OWNER

Shoji Osato

WEEK-END HOUSE AT FURNESSVILLE, INDIANA
DESIGNED BY V. M. S. HANNELL, OWNER

FACULTY HOUSES, SWARTHMORE COLLEGE

By W. POPE BARNEY, Architect

Here the problem of building substantial and commodious houses, which would have a minimum of upkeep and give the maximum of return in charming living conditions, was further complicated by a very strict building code and a limited budget. So limited were both budget and building site that a grouping of units was necessary, both practically and aesthetically. It seemed very desirable to get all the unsightly services concentrated in and around a somewhat sunken courtyard—otherwise the proximity of one tenant's drying yard to another's tea terrace would have been as objectionable as is generally the case with an intensive use of land. All excavated material was used to form a garden terrace around three sides of the quadrangle, thus placing completely above the ground the laundries and garages which faced the sunken court on the basement level.

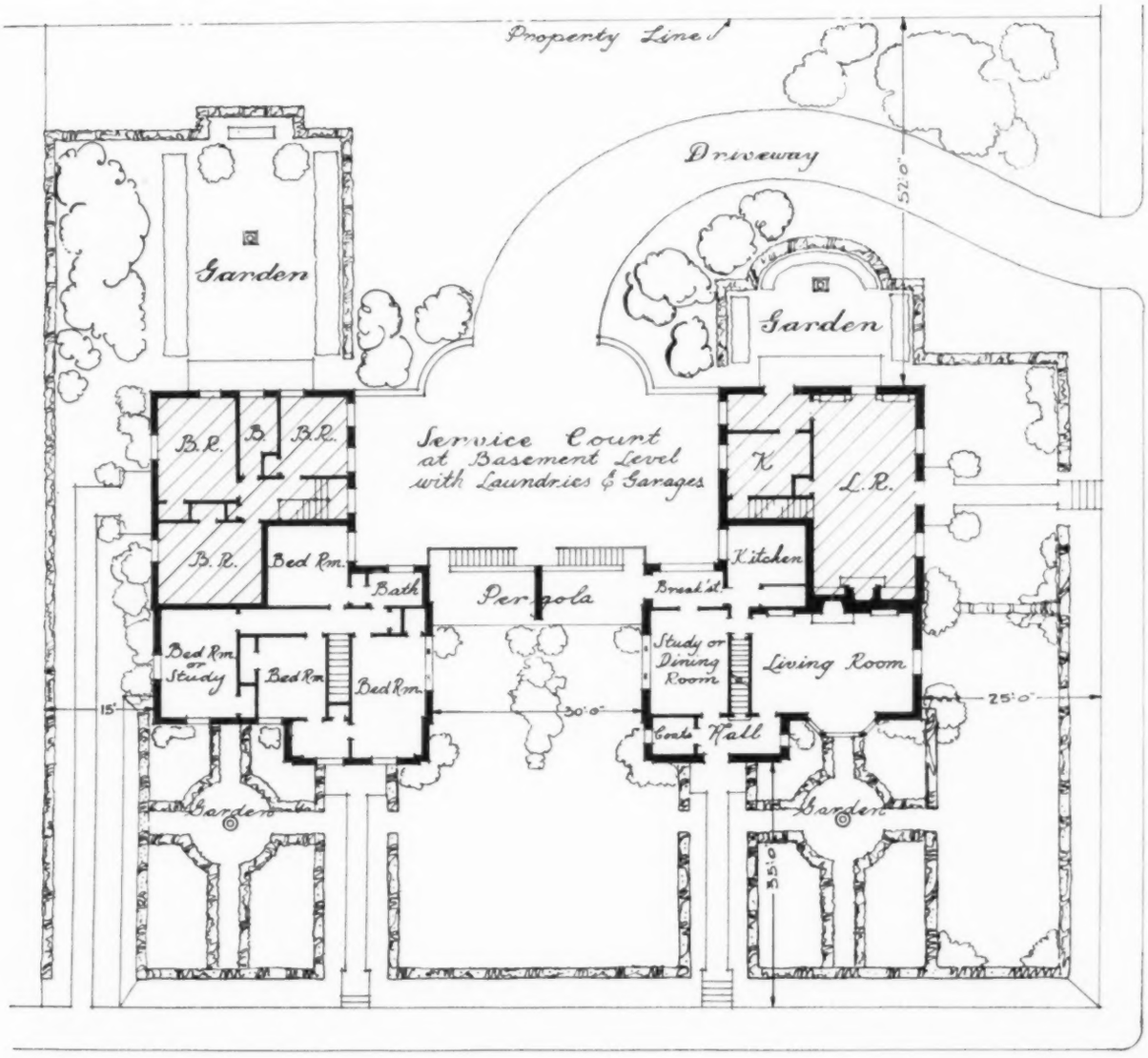
The plans of the larger units, for economy are identical, but are reversed. An attempt was made to eliminate a through hall and yet a private way through the houses was maintained. The smaller units were thought of as more applicable to families without children.

The construction is of stone to the first floor joists, and cinder block above. Both materials are veneered with a colonial clinker brick at $25 per thousand, on the outside. Above the first floor the inside walls are furred and plastered on "rock" lath. Trim was detailed, but closely followed stock sections. All rooms are papered with small figured papers and painted, except kitchens, which are only painted.

The ceiling of the second floor is suspended 4 ft. below the roof and is insulated with Thermofill. The air space thus formed is vented into the chimney and kept in circulation by vents at the top of each closet of the second floor. The result, despite the flat roof, is a cooler second floor than that of the average house with a pitched roof.

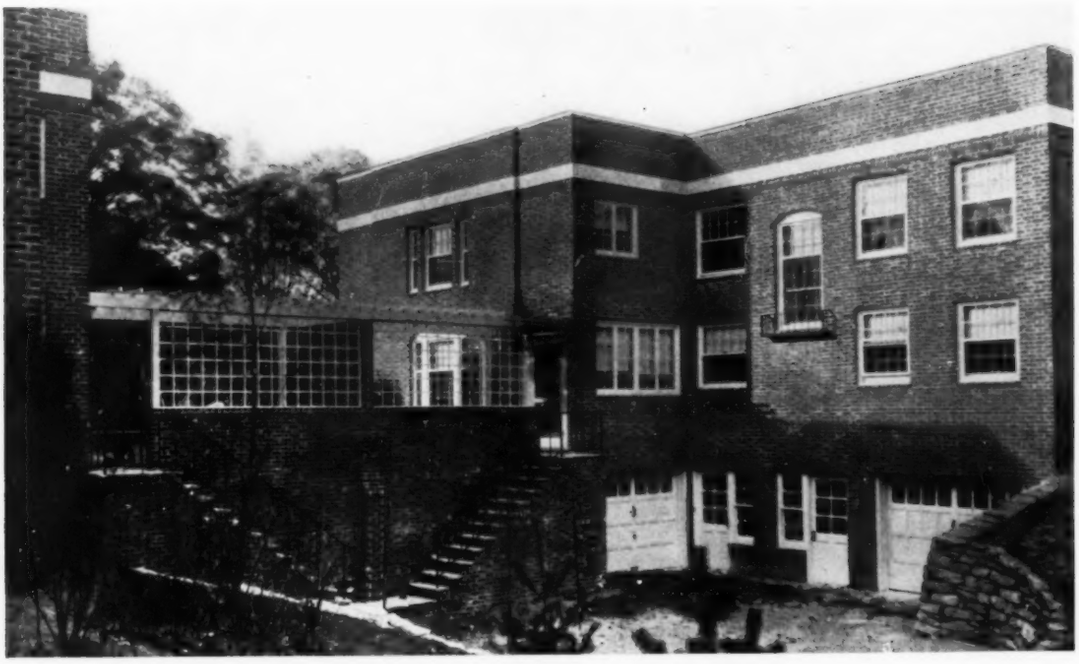
The heating system is warm air with a furnace in each unit. An automatic gas hot water heater and gas range are included in the house costs.

The cost of the total group completed in October 1930, including grading, paving, planting, clothes-drying poles, sunken garbage receivers, window shades, wall paper, electric light fixtures and utilities brought in from the street underground was $40,400. The total cubage was 110,000 cu. ft., at 37.7c per cubic foot.

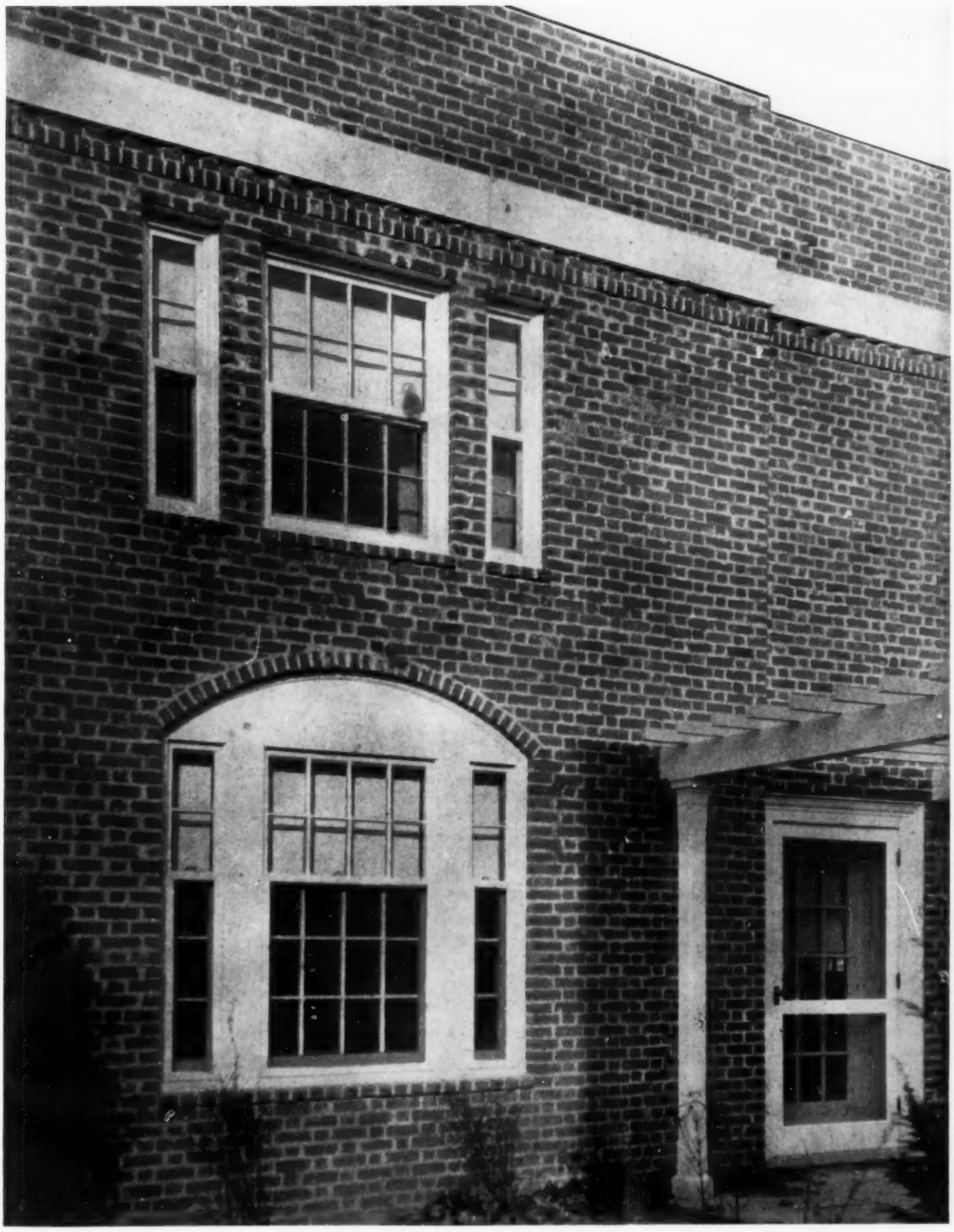


PLAN AND DETAILS, FACULTY HOUSE
SWARTHMORE COLLEGE, PENNSYLVANIA
W. POPE BARNEY, ARCHITECT

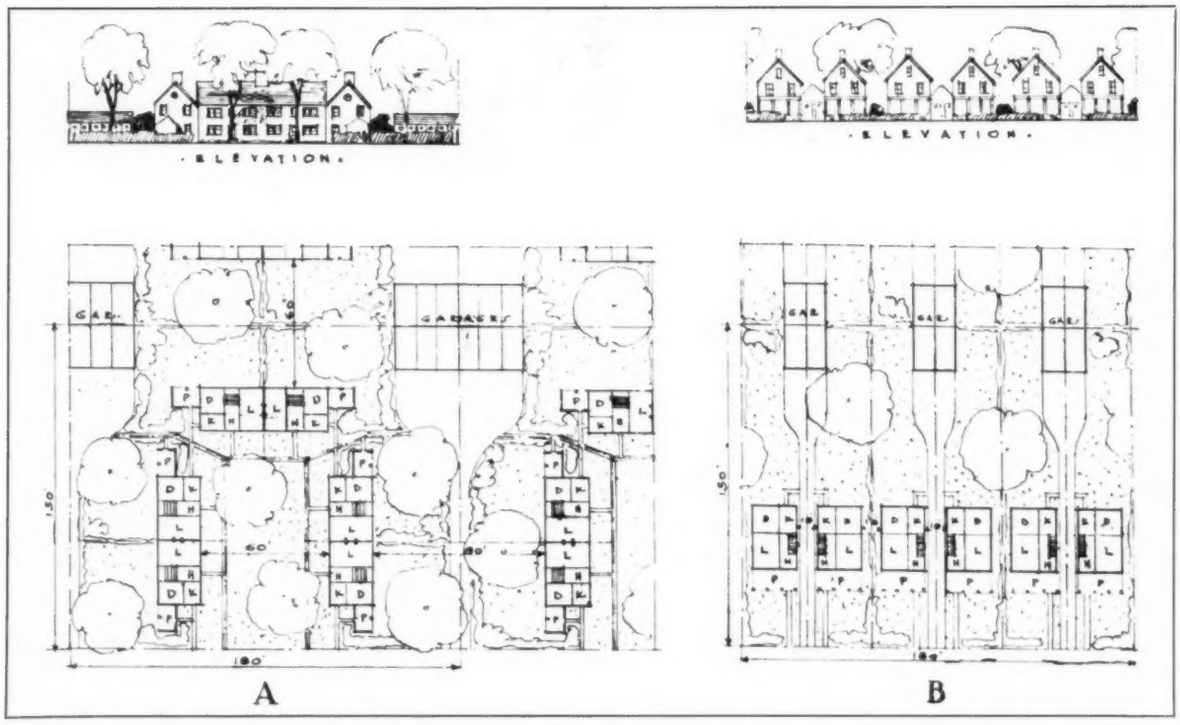
FACULTY HOUSE ENTRANCE
SWARTHMORE COLLEGE, PENNSYLVANIA
W. POPE BARNEY, ARCHITECT



FACULTY HOUSES
SWARTHMORE COLLEGE, PENNSYLVANIA
W. POPE BARNEY, ARCHITECT



FACULTY HOUSE ENTRANCE
SWARTHMORE COLLEGE, PENNSYLVANIA
W. POPE BARNEY, ARCHITECT



CREATE SUBURBAN NEIGHBORHOODS

Mr. Eugene H. Klaber, architect, Chicago, submitted the above sketches showing a desirable and undesirable method of dividing land for suburban use. Diagram B is intended to illustrate the fact that the purchaser of an individual piece of ground can do nothing to establish the proper relation between his house and that of his neighbor. His only salvation rests upon the architect working with the real estate subdivider who should create neighborhoods instead of being satisfied with parceling out small lots.

"My main thesis," says Mr. Klaber, "is that group development in some form or other is the duty of the subdivider, because he is the only one who can accomplish it. The individual who buys the average rectangular piece of urban real estate has no control over the actions of his neighbors, and however considerate he may be of his neighbors' light and air he has no assurance that they will reciprocate.

"The main trouble with all of our urban and most of our suburban subdivision is that it has contented itself with slicing a piece of ground into a certain number of lots, and has felt no obligation toward the eventual development that will take place and the kind of life that it is possible to lead there. This lack of forethought has resulted in the monotonous rows of boxes with which we are all familiar, and which, besides being ugly, are very wasteful. It must be hammered into the consciousness of the real estate world and similarly made clear to all architects concerned with housing that these antiquated methods must be abandoned, not only in the interest of the public, but for their own good."

STAIRWAYS

RAMPS

ESCALATORS

By A. LAWRENCE KOCHER and ALBERT FREY

Stairs, ramps and escalators may be considered conveyors which make possible communication between different levels.

Stair treads and risers should be of uniform width and height throughout each flight.

The color of risers and treads should differ as an aid to visibility.

When stair rail passes stringer course the clearance should be at least 3 inches.

For stairways in primary schools reduce the height of risers to seven inches or less.

Stairways exceeding 12 feet in height should have an intermediate landing.

All stairs in multi-story buildings should be fireproof.

Treads and landings should be non-slip.

Stairways used as required means of exit should be at least 44 inches wide between faces of walls or 40 inches wide between face of wall and an open balustrade or between two balustrades.

There should be well-secured guards or balustrades on both sides of stairs.

Balustrades with ornamental pattern are dangerous because garments are caught in projections or angles.

Handrails attached to walls should project not more than 3½ inches and return to wall at start and end. Handrails should be of a shape and size that is comfortably grasped.

Provide a continuous handrail for children in schools, hospitals and houses.

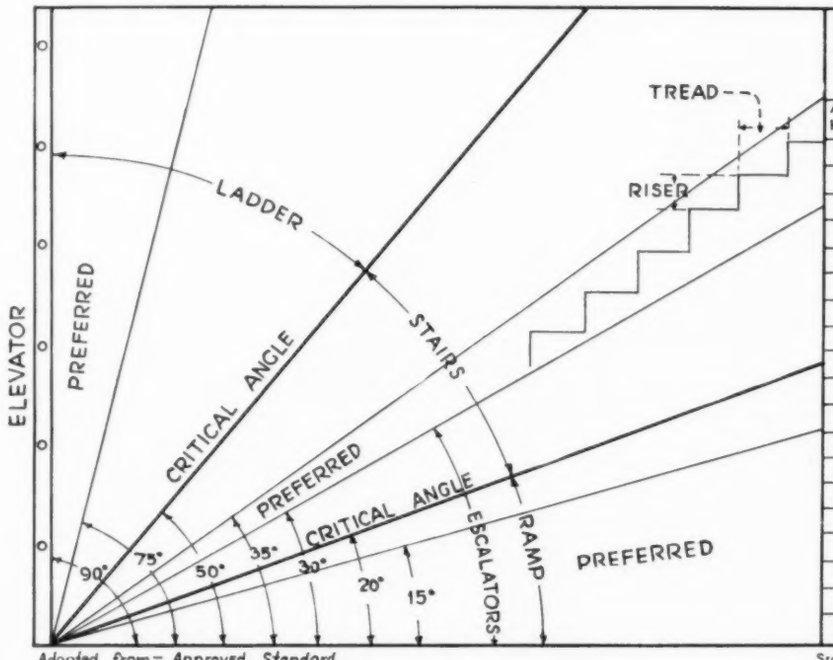


TABLE OF RISERS AND TREADS FOR STAIRS
TREAD + RISER = 17½"

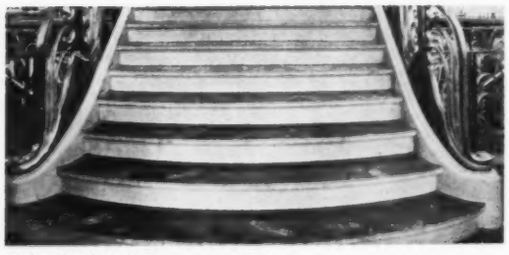
ANGLE WITH HORIZONTAL	RISER IN INCHES	TREAD INCHES	
22°-00′	5	12½	
23°-14′	5¼	12¼	
24°-38′	5½	12	
26°-00′	5¾	11¾	
27°-33′	6	11½	
29°-03′	6¼	11¼	
30°-35′	6½	11	P'F'D
32°-08′	6¾	10¾	
33°-41′	7	10½	
35°-16′	7¼	10¼	
36°-52′	7½	10	
38°-29′	7¾	9¾	
40°-08′	8	9½	
41°-44′	8¼	9¼	
43°-22′	8½	9	
45°-00′	8¾	8¾	
46°-38′	9	8½	
48°-16′	9¼	8¼	
49°-54′	9½	8	

Adapted from — Approved Standard Workmen's Compensation Service Bureau

Supplied by — American Abrasive Metals Co.

Galloway

Long Island commuters arriving at Pennsylvania Station, New York City. Note congestion at approach to stairway. Crowds move more rapidly at level than in ascending stairs.



Modern French Architecture

Stairs should be widened at base because moving crowds hesitate at start of ascent.

Galloway

Crowds are obliged to be cautious in descending stairs. There are more accidents on subway stairs than on platforms. ➔

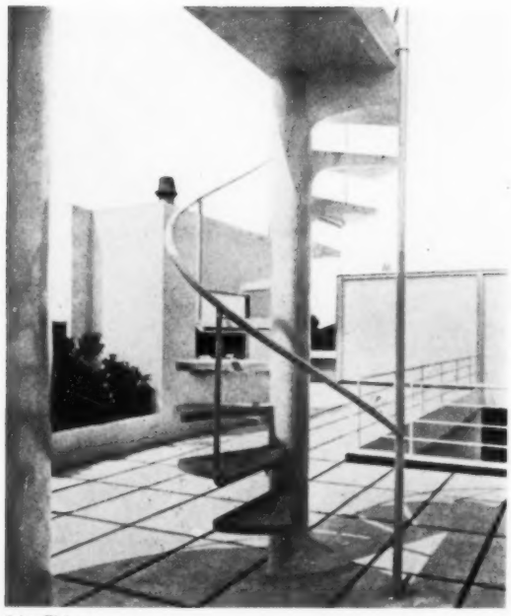
Gallimard

Ramps of easy gradient permit as rapid movement of crowds as on level. Congestion is thus avoided. Grand Central Station, New York City.

Cahier D'Art

Adaptation of ramps to residence of luxury class. An example of an outdoor ramp between two terrace levels. The greater convenience justifies the added expense and increased space required. Villa in Poissy, France. Le Corbusier and P. Jeanneret, architects.

Inclines have been generally applied as approaches to "boardwalks" at beaches. This is because of their greater safety. Rockaway Beach, Long Island. →



Cahier D' Art

A minimal cantilever stairway from roof garden to observation platform. Villa in Garches, France. Le Corbusier and P. Jeanneret, architects.

Cahier D' Art

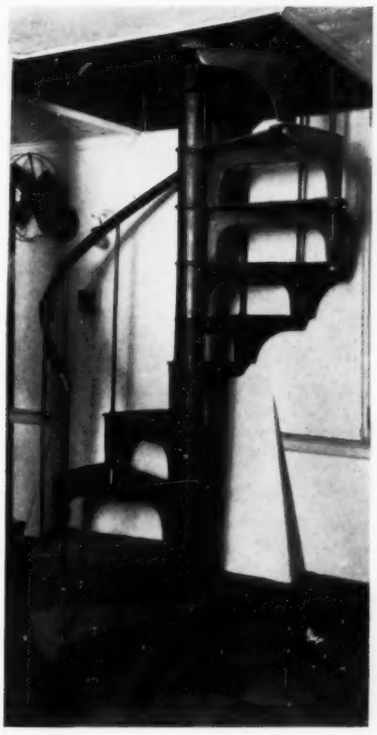
Galloway

Stairway at side of highway bridge that permits descent from upper level to river bank. Cooper's Cave, Glens Falls, N. Y.

Spiral stairway without central support, cast in place. Villa in Poissy, France. Le Corbusier and P. Jeanneret, architects.

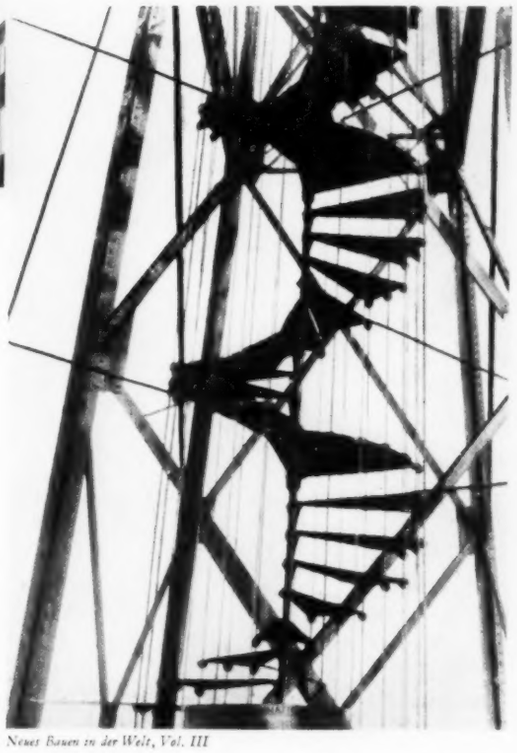
SPIRAL STAIRS IN REINFORCED CONCRETE.

Spiral stair with a minimum of parts. An application of a steel stairway for residence. Handrail is chromium-plated. Other parts are aluminum-painted. Treads are of red rubber. House of C. H. Van der Leeuw, Rotterdam. Brinkman and Van der Vlugt, architects.



Brown Bros.

A stairway of standard construction, joining two floor levels of an office, requiring least possible space. (New York City.)



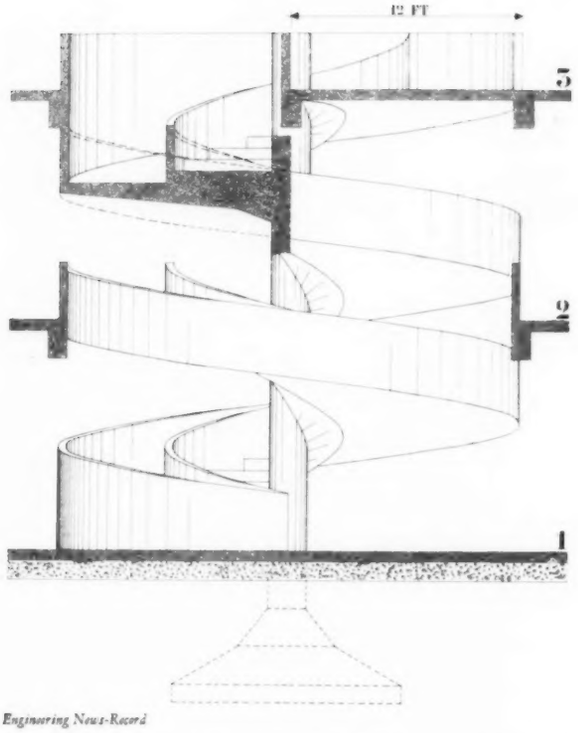
Neues Bauen in der Welt, Vol. III

Stairway, lightest in weight, hung by cables which also serve as safety guards. Pont Transbordeur, Marseilles, France. ➡

SPIRAL STAIRS IN STEEL.

Courtesy Otis Elevator Co.

Escalators require more space than stairways and elevators but are preferred by crowds in department stores. They afford a pleasant communication between different display and sales levels which have almost equal display and sales value. Charles Moore and Company Department Store, Perth, Australia.



Engineering News-Record

Combined stairway and ramp for hospital. Service stairway at center. Outer ramp for conveying patients.

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—Architectural Construction by Voss and Henry, Vol. 1, 431, 581, 800, 831.

—Stair Builders' Guide by M. Williams, N. Y., 1928.

—The American Architect, January, 1930, pp. 64, 66, 120.

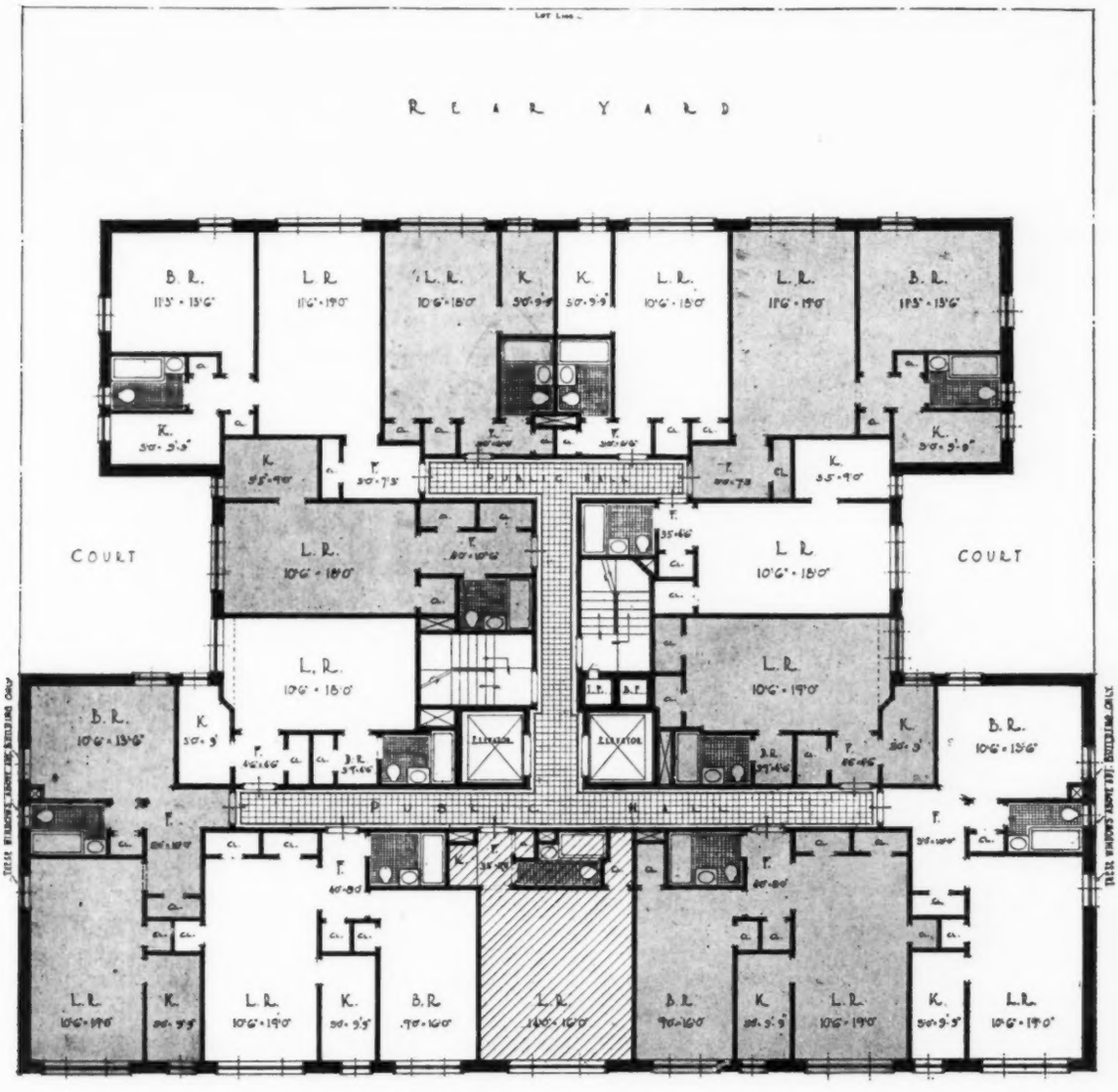
APARTMENTS FOR THE AVERAGE WAGE-EARNER

Efforts to provide apartment accommodations suited to the purse and purpose of the tenant of average means indicate a new field of activity for architects and builders.

Several months ago Borough President Julius Miller of Manhattan called together a committee of twenty-five builders to consider the problem of providing adequate housing at moderate rates. Numerous low-priced sites were considered. For the prospective type of client a land cost of $15 a square foot was agreed upon. The committee settled on a 12-story fireproof building on a 60-foot street as the standard. Through the cooperation of a number of architects, numerous plans for the particular class of house desired, to be built on a lot 100 feet square, were available for inspection. Of those submitted, two were accepted as having greatest possibilities. One of these was drawn by Charles H. Lench and the other by Emery Roth.

The Lench Plan has interior bathrooms throughout, a type of design permitted by the new multiple dwellings law when the suites contain not more than two rooms, when the cooking space is not over 49 square feet in area, and when certain technical requirements are met. The plan embodies on each floor 6 two-room apartments and 7 one-room suites, each supplied with its own kitchen, bath, and foyer. Living rooms are generally 10′ 6″ by 19′ 0″, while bedrooms are approximately 10′ 6″ by 13′ 6″. Exclusive of kitchens, foyers, and bathrooms, the floor contains 19 rooms.

While the sizes of the rooms are generally greater on the Lench Plan than on the Roth Plan, and while the Lench apartments contain a greater amount of



PLAN PREPARED BY CHARLES H. LENCH, ARCHITECT

closet space, it cannot be overlooked that the small number of rooms in each suite makes them unsuitable for all but childless couples.

The total rental to be derived from a building designed on the Lench Plan amounts to $119,940. The rental table shows the following monthly room rates for the indicated classes of apartments: three-room suites, $20.00 to $34.72 per room; two-room suites, $18.75 to $37.50; one-room suites, $27.50 to $66.66.

In the Roth Plan all bathrooms are on the outside of the building. The typical floor contains 2 three-room suites, 6 two-room apartments, and 2 one-room suites, each with its own foyer, kitchen or kitchenette, and bath. Living rooms are generally 11′ by 19′ and smaller, while bedrooms vary from 9′ by 12′ to 9′ by 16′. Exclusive of kitchens, foyers, and bathrooms, the floor contains 20 rooms, and to this total must be added the 4 dining alcoves and the dressing chamber which are not counted as rooms. Where the Lench Plan contains a total of 367 rooms, the Roth Plan has 332, plus 48 interior dining alcoves.

The total rent to be obtained from a building erected on the Roth Plan amounts to $109,880, a sum slightly less than the total of $119,940 promised by the Lench Plan. The following is the monthly rent per room under the Roth Plan: three-room apartments, $20.00 to $41.66; four-room apartments, $21.25 to $30.00; two-room apartments, $33.34; one-room apartments, $27.50 to $64.17.

In bringing the rents for these apartments below those asked for similar accommodations elsewhere, economy has been kept constantly in mind. The plans have been drawn to permit the acceptance of such rent and still allow the builder or promoter a return of 10 per cent or more on his investment after carrying and operating charges have been met.

PLAN PREPARED BY EMERY ROTH, ARCHITECT

PLANNING THE SMALL MASONIC TEMPLE

By CARROLL E. WELCH, Architect

The problem of financing the construction and maintenance of the Masonic lodge is usually the first to be considered by the building committee. Certain questions must be given thought:

(1) Will the lodge room be available for rent to other organizations?

(2) Will a portion of the building be available for rent to a Masonic club or other clubs?

(3) Will it be possible to rent an auditorium for dances and entertainments? If so, to what extent?

(4) Will it be possible to rent the banquet hall and kitchen for public dinners and other functions?

(5) Will the income from these sources be sufficient for a suitable return on the total investment if the temple is to be devoted only to Masonic functions? If not, is the property located in a business section?

(6) Can the first floor be utilized for shops and stores?

(7) Can the second floor be arranged for general office space or for doctors' or lawyers' suites?

The answers to these seven questions are, in a great measure, the dictating factors in the general design and location of the proposed temple. Vacancies, obsolescence, redecoration of rentable quarters and superintendence of the building should be considered in calculating maintenance cost.

SELECTION OF SITE

Commercial Location: If stores and office space are necessary for the rental income, the building site should be centrally located.

Much can be said for and against the semi-commercial type of Masonic lodge. A central location makes the temple easily accessible for business men and visitors, for committee work and special meetings. On the other hand, it is difficult to provide adequate parking facilities; traffic noises, higher land cost and taxes are other objectionable features.

Residential Location: If stores and office space are not needed and enough revenue can be obtained by renting the lodge room, auditoriums and banquet hall, then a location can be selected away from the business district.

Such a purely Masonic temple would have lower property cost, smaller taxes, a more pleasant setting and better parking facilities on side streets. Food supplies and other necessary items would, of course, have to be carted to the lodge from the commercial district. Also, it has been found that club facilities are not so well utilized when the temple does not have a central location.

Service Deliveries: For any temple there must be service deliveries. For an interior lot service access can be had only by an alley down one or both sides of the building or through an alley in back of the property (which is seldom found in the average town or small city). If the lot is in a business section, a 5- or 6-foot alley from the front street is extravagant; yet without such an alley or service entrance there will be severe interference of traffic. When a corner lot is available, separate entrances for service and banquet hall can be obtained.

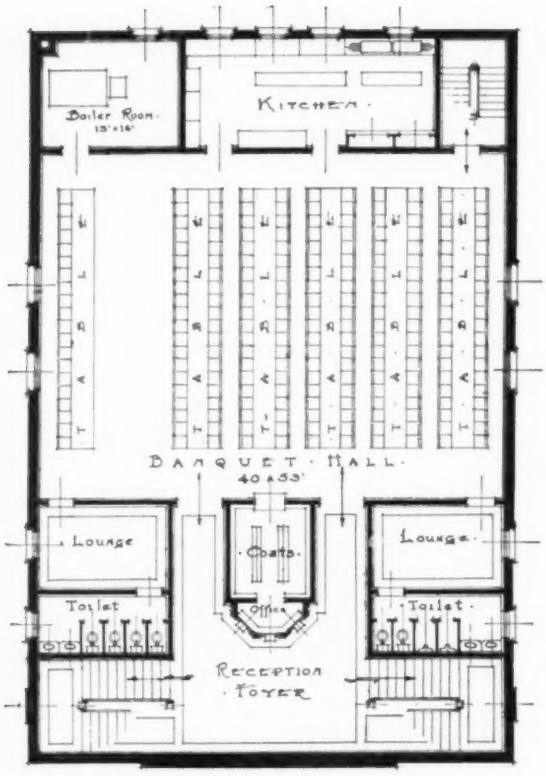
Size: The lot should be large enough to take care of the parking of automobiles if no other provisions are available. The minimum size of a Masonic temple is approximately 55 foot width and 85 foot depth, so that a lot 60 to 75 feet wide by 120 to 150 feet deep is the smallest to be desired.

PLANNING REQUIREMENTS

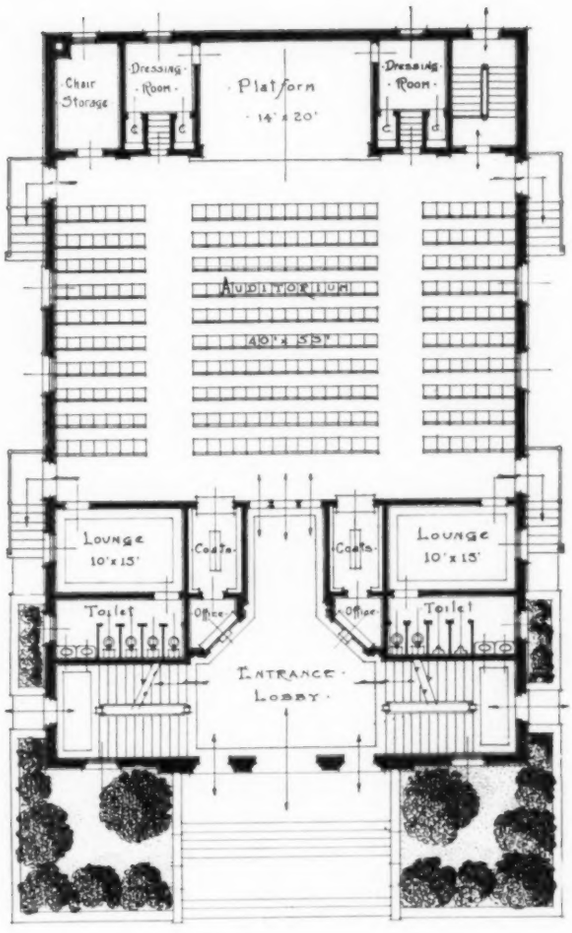
For the average town or small city of 10,000 to 20,000 inhabitants, the Masonic temple will require a lodge room accommodating seven or eight Masonic or similar semi-secret organizations; a Chapter and possibly a Commandary; an assembly room or auditorium; a banquet hall, reception room and locker room; committee rooms; candidates' room; coat rooms, kitchen and, if necessary, a separate club room.

The accompanying plans have been drawn to illustrate a typical small Masonic temple. In the following discussion of the requirements of the typical Masonic temple, reference is made to these plans.

Banquet Hall and Kitchens: These rooms, like the auditorium, should be so designed that they may be rented for public use. The entrance should not interfere with other activities in the building. These rooms are illustrated on the basement plan.



BASEMENT AND GROUND FLOOR PLANS



A TYPICAL MASONIC LODGE
CARROLL E. WELCH, ARCHITECT

The banquet room should seat 200 to 250 persons; in order to accommodate organizations of various sizes, the room should be easily subdivided. The kitchen should be large enough to accommodate necessary equipment and be readily convenient to the banquet hall.

Opening into the banquet hall are a large coat room and lounges with toilet rooms for both men and women. These dependencies are important and should not be cramped for space.

Auditorium: The assembly room is generally located on the ground floor so that it may be rented independently. It should seat from 200 to 300 persons, with or without a balcony. Since the auditorium is used for public shows and dances as well as large smokers and social entertainments, it should be arranged with a stage, dressing room, cloakrooms, retiring rooms and toilet facilities. These should be of ample proportions and conveniently located.

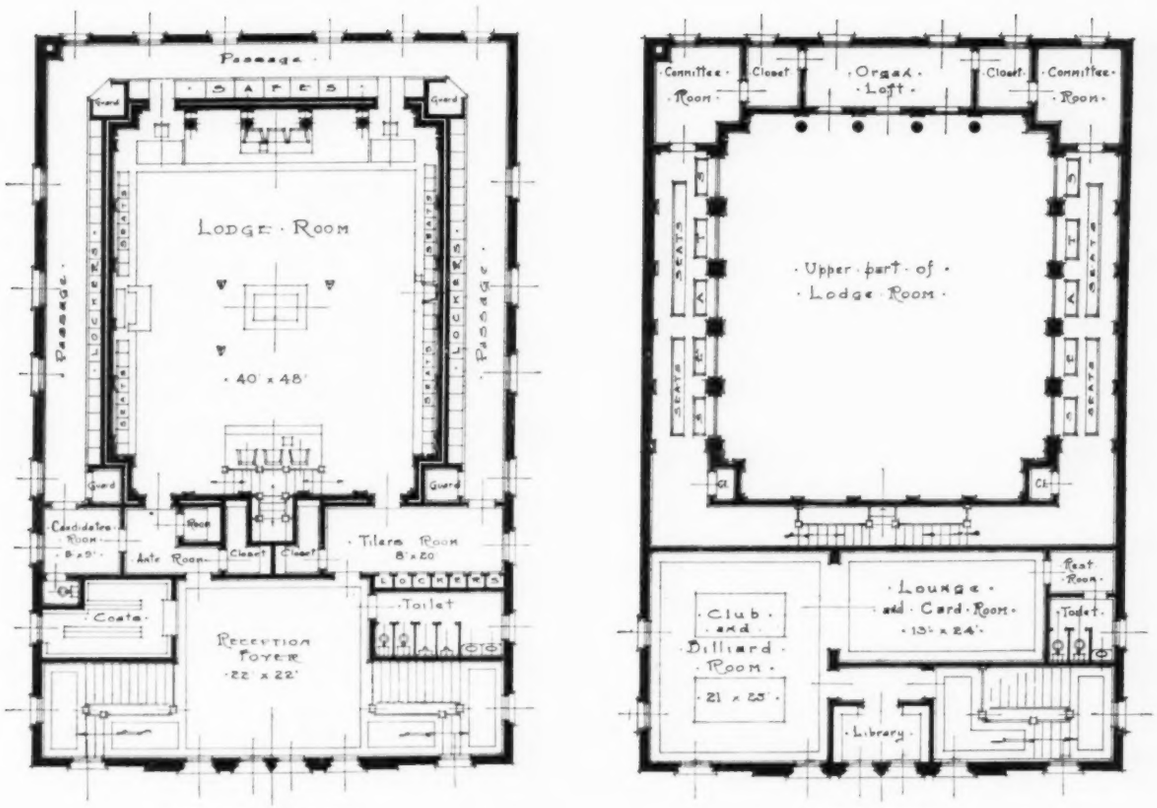
Lodge Room: Many a good plan has been otherwise ruined by either (1) the extreme lack of space outside the lodge room for the use of members during refreshments or recesses, or (2) the utter impossibility of emptying the building in case of fire.

The lodge room, in a temple of this size, usually measures about 30 feet in width, 40 to 45 feet in length and about 20 feet in height. In the accompanying plan it is located on the top floor and arranged for Commandary purposes as well as for the lodge.

A 5-foot passage surrounds the lodge room and is provided with niches or stations for guards during the working of the Commandary degrees. The corridor has lockers for uniforms and other equipment.

A small soundproof room, approximately 6 feet square, is used as a Chamber of Reflection; it should be located near the entrance to the lodge room.

In the east or main end of the room is the Master's station, raised three steps above the floor level and sufficiently wide to accommodate eight or ten visitors. There is an illuminated letter "G" over the Master's chair. To the west or opposite end of the room is the Senior Warden's station, raised two steps above the floor level. The Junior Warden's station is on the south side of the room and is raised on a



SECOND FLOOR PLAN

THIRD FLOOR PLAN

A TYPICAL MASONIC LODGE
CARROLL E. WELCH, ARCHITECT

platform one step above the floor level. The Secretary's and Treasurer's stations are in the two corners of the Master's end of the room, the Treasurer on his right and the Secretary on his left. Subordinate officers of the lodge are placed on the main floor level.

Every lodge room should have an organ. It is usually placed over the Master's or Senior Warden's station with the keyboard and organist either in the north opposite the Junior Warden's station or in the west on a mezzanine floor over the Senior Warden's station.

In the center of the room on the main floor level is an altar about 3 feet wide, 5 feet long and 3 feet high. It is surrounded by a kneeling step, 6 or 7 inches high. Three candlesticks or electrically illuminated standards are placed around the altar to indicate symbolically the East, West and South. If the lodge room is to be used by a Chapter, the rectangular altar must be made movable so that a triangular-shaped one can be substituted.

In many temples a marble or mosaic panel, called the trestle board, is set flush with the floor. It measures 6 feet wide by 12 feet long. It is surrounded by an ornamental border, and in the center is placed a "blazing star".

All light in the lodge room should be controlled by the Junior Deacon from a switchboard located near the entrance door. All lights with the exception of the letter "G", the lights on the Secretary's and Treasurer's desks and the three candlesticks must be on one switch so that they may be dimmed by one control.

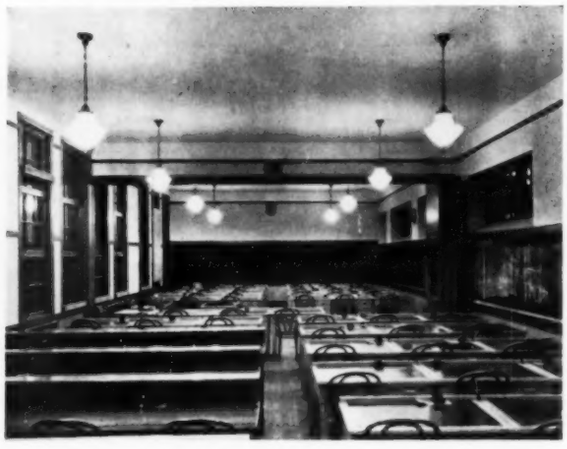
If a gallery is placed in the lodge room, access to it should only be from the lodge room. It should not be entered except by those who have passed the Tiler.

Reception Foyer: This room and corridors on the lodge room floor should have ample proportions since they are used as a gathering place for members and visitors during recesses and refreshments.

Locker and Coat Rooms: These, together with anterooms and candidates' rooms, are usually grouped

(Continued on page 55)

DIRECT ILLUMINATION



SEMI-INDIRECT ILLUMINATION

LIGHTING THE CLASSROOM

By H. L. LOGAN, Engineering Consultant

The artificial lighting of classrooms is usually based on the assumption that daylight is adequate during regular school hours. The artificial system is thus intended to provide illumination at night and on very dark days. This subject of the adequacy of daylight is rather difficult because a careful examination upsets many cherished notions.

Outdoors, an object usually has light falling on it from a large portion of the sky so that even under overcast conditions the illumination is satisfactory. Indoors, the amount of sky visible from any part of the interior, and therefore the amount of daylight proceeding to that point, is strictly limited. The windows, no matter how large, are only holes in the side of a "box." The greater part of the dome of the sky is hidden by the top and the three "blank" sides of the box. Surrounding buildings and obstructions reduce still further the small portion of sky visible from the interior of most classrooms.

The table gives the average daylight intensity during summer for classrooms in the latitude of New York, for the school hours. It shows that next to the windows the daylight is high, and although it varies greatly from hour to hour, it is adequate all day long. However, the daylight drops rapidly as it goes farther into the room, until at 20 feet from the windows it becomes inadequate and remains so all day long, all year round, under the best outside daylight conditions.

Natural lighting is best in the summer when the schools are closed. The figures given in the table should be divided by nine to indicate the condition of the light on a dull day in midwinter. It is then found that the daylight is inadequate all day long as near as 15 feet to the windows. Engineering experience indicates that 15 feet from the windows marks the boundary of adequate daylight in classrooms with one exposure during the school year.

If classrooms were kept to a maximum width of 15 feet (with present ceilings), daylight would be adequate over the whole of their area for most of the school day all through the school year. But classrooms are usually from 20 to 30 feet wide and from one quarter to one half of their area must normally receive inadequate daylight.

Rooms with double window exposure have adequate daylight under most conditions. But the average classroom does not and cannot have double exposure. This fact of the inadequacy of daylight in classrooms, coupled with the evidence collected by the Eyesight Conservation Council of America on the progressive development of eye troubles in school children as they rise from class to class, points to the necessity for planning the artificial lighting of the

Table

AVERAGE DAYLIGHT INTENSITIES FOR SUMMER

Distance from Windows	Southern Exposure		Western Exposure		Eastern Exposure		Northern Exposure	
Hours →	9–12	1–3	9–12	1–3	9–12	1–3	9–12	1–3
3 ft.	300 fc.	200 fc.	140 fc.	100 fc.	170 fc.	110 fc.	150 fc.	160 fc.
8 ft.	160 fc.	170 fc.	80 fc.	85 fc.	100 fc.	85 fc.	80 fc.	135 fc.
15 ft.	75 fc.	40 fc.	35 fc.	20 fc.	40 fc.	22 fc.	35 fc.	50 fc.
20 ft.	7 fc.	4 fc.	3 fc.	2 fc.	4 fc.	2 fc.	3 fc.	5 fc.
30 ft.	1 fc.	0.5 fc.	0.4 fc.	0.2 fc.	0.5 fc.	0.2 fc.	0.4 fc.	0.6 fc.

classroom to serve as an auxiliary to daylight as well as to replace daylight during the night hours.

To enable the artificial lighting to perform this double function, a minimum average intensity of 10 foot-candles must be provided, with a desirable intensity of 25, and the inside row of lights must be controlled separately from the outside row preferably by means of a "Sun-Valve" so that adequate illumination is maintained over the "shadow band" of the classroom during daylight fluctuations.

Ideal classroom lighting for rooms of one exposure should therefore consist of windows to the ceiling along one wall, stopping within 6 feet of the blackboard wall; at least six artificial lighting units arranged symmetrically with respect to the seats (not to the room, and not more to one or the other side of the center of area) with a minimum of 200 watts in each—500 watts preferred—and with the inside row automatically controlled by the daylight through a "Sun-Valve"; and the central blackboard area, at least, lighted independently.

Such a system of artificial lighting, removing full dependence on daylight, makes possible a desirable reduction in window area. The window next to the blackboard wall is a handicap to the children. The sky is visible through it to most of the pupils and they cannot exclude it from their peripheral field of view without partly turning away from the teacher. This window is a constant source of irritation and is undoubtedly a factor in the development of optical troubles. It also creates a sheet of veiling glare, or sheen, on the adjacent blackboard, making it difficult to see from two thirds of the seats.

Generally speaking, semi-indirect illumination is the best for classrooms. Direct illumination should be chosen where adequate light can only be secured that way, such as when the formation of the ceilings and the character of the room finishes cannot be made to conform to the requirements for "semi-indirect." Indirect illumination should be chosen for use with large lamps, where the lamp size would cause undesirable brilliancy in semi-indirect units in classroom conditions.

PLANNING THE SMALL MASONIC TEMPLE

(Continued from page 53)

near the entrance to the lodge room. Since this portion of the room is usually two stories high, mezzanine space over these anterooms is afforded for Masonic or Fellowcraft clubs.

Ample coat room and toilet facilities should be provided for the lodge room.

The locker rooms are fitted with shelving for banners, flags, staffs and costumes. Each organization meeting in the lodge room should have a closet for storage.

Candidates' Room: This room is fitted with lockers for the use of candidates. It should have its own toilet facilities.

If required by the Chapter, there should be a well about 4½ feet square and about 12 or 15 feet deep; it should be entered from the top by a trap door, set flush with the floor in the candidates' anteroom.

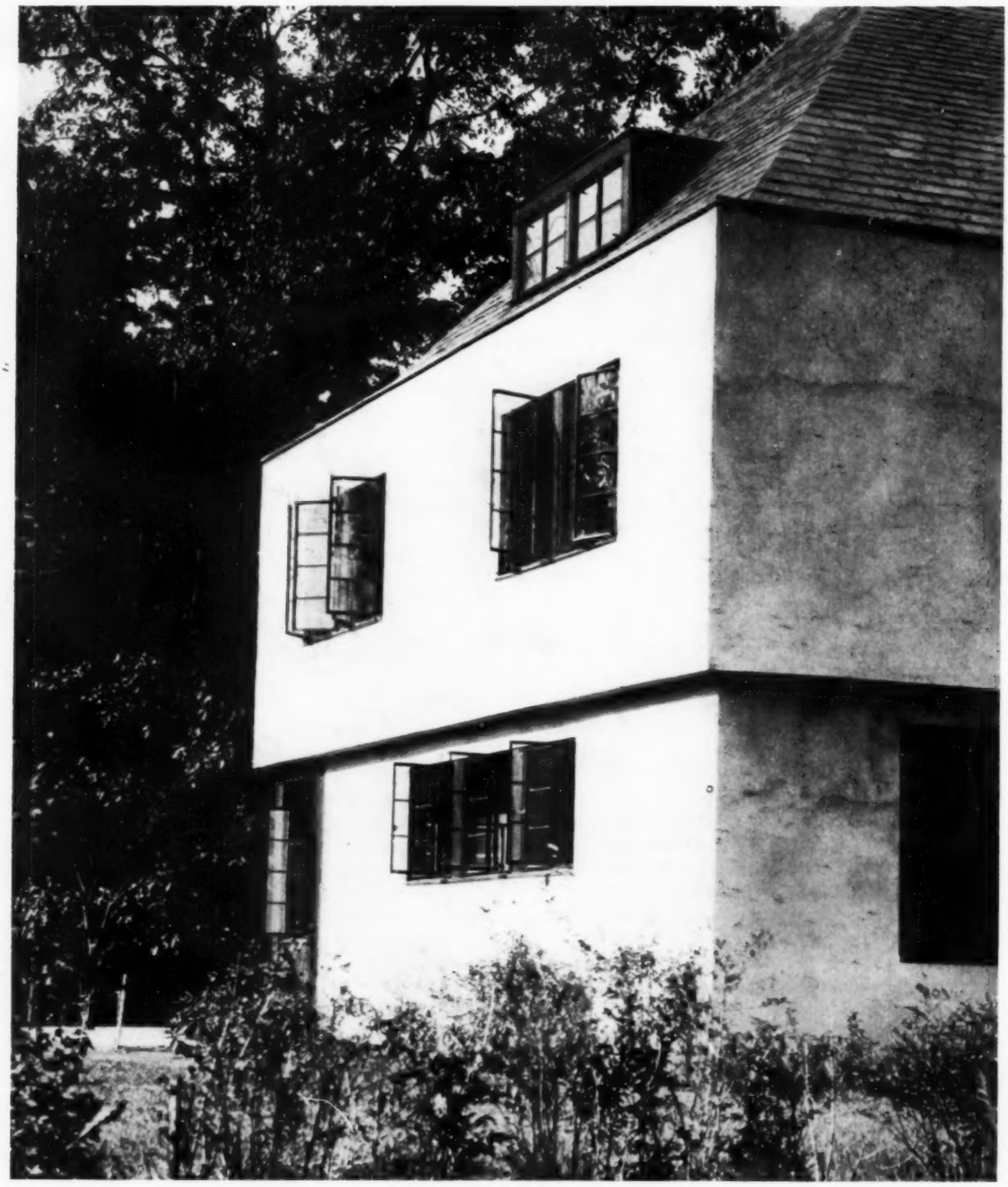
Tiler's Room: In the entry to the lodge is a room for the Tiler. Space measuring 12 to 16 feet is ample for this room. It should be fitted with small covers containing drawers and lockers wherein the Tiler can keep gloves, aprons, visitors' book or card index, gavels and other small paraphernalia belonging to each organization using the lodge room.

Committee and Club Rooms: These may be arranged for use also as card rooms, examining rooms and possibly a library. These can be arranged on the mezzanine floor over the other anterooms (as shown on the third floor plan). Club rooms should provide adequate amusement facilities such as billiard or pool room, lounges, card room, library and reading room. In many instances, accommodations are included for the serving of refreshments, usually by a caterer.

TECHNICAL NEWS AND RESEARCH

ESTIMATING THE COST OF SMALL HOUSES

By ARTHUR BRACE



HOUSE OF DR. J. M. SCHWEITZER, RIVERDALE, NEW YORK CITY
R. C. WEINBERG, ARCHITECT

ESTIMATING BY THE CUBE

One of the most misleading methods of estimating building costs is that of applying a unit price to the building cube. Unfortunately, there has been an altogether too general acceptance of cubic-foot costs by owners, architects, and some contractors. The cubic-foot cost of one building cannot be accepted as a measuring rod for any other building even though it is exactly the same in design and interior finish. There are so many variables due to such features as site, labor efficiency, price and delivery of materials, that such estimates even for similar structures are likely to be very inaccurate. . . .

The large, successful builder has learned that there is no substitute for a carefully priced quantity survey and accordingly treats each job as an individual problem. Architects and newcomers in the contracting field are the worst offenders, and it is they who must be taught that cubic-foot prices when used as a basis of estimate will almost invariably lead to trouble.

PETER A. STONE.*

ESTIMATING THE COST OF SMALL HOUSES

By ARTHUR BRACE†

The cost of construction materials is dependent largely on locality. Prices vary greatly, often without apparent reason. In many cases prices may be affected by lack of competition, local labor, material conditions and temporary shortages. A wide and justifiable variation in the prices of many basic building materials occurs because of the distance from the original supply point. This is notably true in the prices of lumber, brick, cement, tile products, slate and other material of weight or large bulk. The ratio for these commodities, however, should be fairly constant.

The most hazardous guess in the unit cost of construction work is that of labor output. Approximately 45 per cent of the cost of house construction is in labor. In the following tables the labor output is consequently given for various classes and grades of work. It should be emphasized that the figures used are only intended to represent fair averages.

It is estimated that construction labor is now 20 per cent more productive than in 1923 owing to increased efficiency of labor. Building costs have decreased in almost every commodity, in varying degrees ranging from 10 to 30 per cent. The United States Index of Building Material Prices shows a decrease of 13 per cent in the past 18 months.

In the following tables, the materials are based on prices as of March 1931. The total cost figures do not include insurance, bonds, foreman and general supervision, and other overhead expenses.

EXCAVATION

Method	Total Cost per Cu. Yd.
Steam Shovel	$0.60
Drag Scraper (team)	1.00
Grading and Back Fill	.75
Rock Excavation	3.00
Hand Excavation	2.00

CONCRETE

Specification	Material	Labor Cost	Total Cost
Foundation Walls			
Form Work (sq. ft.)	$0.12	$0.06	$0.18
Concrete (sq. yd.)	9.00	3.00	12.00
Concrete Block (sq. ft.)	0.16	0.08	0.24
Floor Slabs			
4″ Concrete	0.13	0.12	0.25
6″ Concrete	0.17	0.18	0.35
1″ Cement Finish	0.07	0.03	0.10

* From an editorial appearing in the June, 1931, issue of *General Building Contractor.*

† In the preparation of the following data, much valuable advice and assistance was given by L. Brandt, housing engineer; Peter A. Stone, managing editor, *General Building Contractor;* The Dow Service; The Statistical Division, F. W. Dodge Corp.; and many contractors working in New York and New Jersey. Appreciation is expressed for their cooperation.

FRAMING LUMBER

Specification	Retail 1,000 Ft. B.M.	Labor Cost	Total Cost[10]
Long Leaf Y. P.			
6 x 8″	$54.00[1]	$41.25[2]	$95.25
6 x 10″	64.00	41.25	105.25
6 x 12″	74.00	41.25	115.25
Douglas Fir			
6 x 8″	36.50[1]	41.25[2]	77.75
6 x 10-6 x 12″	37.00	41.25	78.25
Spruce (Sills and Floor Joists)			
2 x 8″	44.00	22.00[3]	66.72
2 x 10″	46.50	22.00	69.22
2 x 12″	48.00	22.00	70.72
Spruce (Joists in Brick)			
2 x 8″	44.00	27.50[4]	72.22
2 x 10″	46.50	27.50	74.72
2 x 12″	48.00	27.50	76.22
Spruce (Stud Walls)			
2 x 4″	42.00	22.00[3]	64.72
Spruce (Rafters)			
2 x 6-2 x 8″	44.00	22.00[3]	66.72
Southern Pine (Wall and Roof Sheathing)[9]			
1 x 6″ hor.	31.00	23.20[5]	61.10
1 x 8″ hor.	32.00	23.20[6]	61.70
1 x 6″ diag.	31.00	23.20[7]	62.70
1 x 8″ diag.	32.00	23.20[8]	63.30
(Bridging)	20.00		25.50

[1] These timber prices are based on lengths of 22′-24′. For timbers over 24′ and in even lengths of 2′, add $2.50 to $5.00 per 1,000 ft. B.M.

[2] Labor cost (carpenter $1.37½ for 1,000 ft. B.M., overhead not added) based on 30 labor hours 1,000 ft. B.M.

[3] Based on 16 labor hours.
[4] Based on 20 labor hours.
[5] Based on 13 labor hours and a cutting waste of 20 per cent.
[6] Based on 13 labor hours and a cutting waste of 18 per cent.
[7] Based on 13 labor hours and a cutting waste of 25 per cent.
[8] Based on 13 labor hours and a cutting waste of 23 per cent.
[9] Sheathing paper applied at cost of $.04-$.06 per sq. ft.
[10] Nails included.

FLOORING

Specification	Material 1,000 Ft. B.M.	Labor Cost[1] 100 Sq. Ft.	Total Cost[9] 100 Sq. Ft.
Subflooring[10]			
Common #1—1 x 6″	$31.00	$2.32	$6.06[2]
S. Pine (matched) 1 x 6″	31.00	2.32	6.12[3]
Soft Wood Floors			
(1) Yellow Pine			
B+Btr. flat, 1 x 4″	57.50	2.75	10.12[4]
B+Btr. rift, 1 x 4″	85.00	2.75	13.74[4]
#1 com. flat, 1 x 4″	52.50	2.75	9.69[4]
(2) Douglas Fir			
B+Btr. flat, 1 x 4″	43.00	3.78	9.29[4]
B+Btr. rift, 1 x 4″	72.00	3.78	13.00[5]
Hardwood Floors			
(1) Oak			
1st quart. white, 13/16 x 2¼″	125.00	5.50	22.86[6]
1st plain white, 13/16 x 2¼″	95.00	5.50	18.72[6]
1st plain red, 13/16 x 2¼″	85.00	5.50	17.24[6]
2nd plain white, 13/16 x 2¼″	75.00	5.50	15.96[6]
2nd plain red 13/16 x 2¼″	72.50	5.50	15.61[6]
1st plain white, 3/8 x 2″	75.00	5.84	16.68[7]
2nd plain red, 3/8 x 2″	60.00	5.84	14.53[7]
(2) Maple			
1st grade, 13/16 x 2¼″	92.50	5.50	18.38[6]
2nd grade, 13/16 x 2¼″	85.00	5.50	17.24[6]
1st grade, 13/16 x 3¼″	92.50	4.81	16.76[8]
2nd grade, 13/16 x 3¼″	85.00	4.81	15.80[8]
3rd grade, 13/16 x 3¼″	68.00	4.81	13.24[8]
3rd grade, 13/16 x 2¼″	60.00	5.50	13.89[6]

[1] Labor cost includes carpentry at $1.37½ per 100 sq. ft., exclusive of overhead.
[2] Based on 1¾ labor hours and 17% waste.
[3] Based on 1¾ labor hours and 19% waste.
[4] Based on 2 labor hours and 28% waste.
[5] Based on 2¾ labor hours and 28% waste.
[6] Based on 4 labor hours and 38% waste.
[7] Based on 4¼ labor hours and 43% waste.
[8] Based on 3½ labor hours and 28% waste.
[9] Nails included.
[10] Subflooring is figured as laid diagonally.

SUNDRY ITEMS

Parquetry Flooring

Solid or veneered: Mounted on paper or canvas in squares.
Plain Oak (field only): 5/16 used with subfloors.
Quartered Oak: 5/16 used with subfloors.
Material prices run as follows:

5/16"	$.20–$.70
3/8"	.35– .80
1/2"	.35– .80
5/8"	.35– .80
13/16"	.35– .80

Scraping and Sanding	Labor Hours 100 Sq. Ft.	Cost per 100 Sq. Ft.
Softwood Floors	2½–3	$4.13
Hardwood Floors	2½–4	6.50

EXTERIOR TRIM

Specification	Material 1,000 Ft. B.M.	Labor Cost[1] 100 Sq. Ft.	Total Cost 100 Sq. Ft.
SIDING			
Drop, 1 x 6"	$62.50	$2.06	$9.97[2]
Bevel, 6"	67.50	2.41	10.95[3]
Bungalow, 8"	66.00	2.41	10.43[4]
Colonial, 8"	77.00	2.41	11.75[4]
Colonial, 10"	96.00	2.41	13.84[5]

	100 Lin. Ft.	100 Lin. Ft.	100 Lin. Ft.
EXTERIOR TRIM			
Base, corner boards	$3.00	$3.78[6]	$6.78
Frieze, facia, plancier	25.00	7.91[7]	32.91
Crown, bedmolding	5.00	3.78[6]	8.78
Porch plate	5.00	7.56[8]	12.56
Balustrade	144.00	22.00	146.00

	100 Sq. Ft.	100 Sq. Ft.	100 Sq. Ft.
Porch ceiling	$5.00	$5.50[9]	$10.50
Lattice work	5.00	11.00[10]	16.00
Porch columns (each)	6.00	2.75	8.75

EXTERIOR TRIM

Specification	Material 1,000 Ft. B.M.	Labor Cost[1] 100 Sq. Ft.	Total Cost 100 Sq. Ft.
	Frame and Glazed Sash	Unit	Unit
WINDOWS[11]			
Wood, Cellar (3 lights 12 x 18")	$2.30	$1.38[12]	$3.68
Double Hung	6.00	2.06[13]	8.06
Steel Casement	11.00	1.62[14]	12.62
	Frame and Door	Unit	Unit
DOORS[19]			
Plain Oak (Entrance)	$32.50	$5.83[15]	$38.33
White Pine (Entrance)	23.50	5.16[16]	28.66
White Pine (Others)	14.50	5.16[16]	19.66
Plain Oak (Interior)	15.50	4.13[17]	19.63
White Pine (Interior)	7.00	3.44[18]	10.44
Unselected Birch (Interior)	11.75	3.44[18]	15.19

HARDWARE $175–$250 (including locks)

[1] Labor cost includes carpentry at $1.37½ exclusive of overhead.
[2] Based on 1½ labor hours and 25% waste.
[3] Based on 1¾ labor hours and 25% waste.
[4] Based on 1¾ labor hours and 20% waste.
[5] Based on 1¾ labor hours and 18% waste.
[6] Based on 2¾ labor hours.
[7] Based on 5¾ labor hours.
[8] Based on 5½ labor hours.
[9] Based on 4 labor hours.
[10] Based on 8 labor hours.
[11] Prices based on average size window. For setting frames in brick veneer wall, add ½ hour to labor hours.
[12] Based on 1 labor hour for setting frame, fitting and hanging sash.
[13] Based on 1½ labor hours.
[14] Based on 1¼ labor hours.
[15] Based on 4¼ labor hours.
[16] Based on 3¾ labor hours.
[17] Based on 3 labor hours.
[18] Based on 2½ labor hours.
[19] Prices based on average size door. For frames in brick veneer wall, add 60% approximately.

INTERIOR TRIM

Specification	Material Unit	Labor Cost[1] Unit	Total Cost Unit
WINDOW CASING			
Softwood	$1.75	$1.72[2]	$3.47
Hardwood	2.25	2.75[3]	4.90
DOOR CASING (One Side)			
Softwood	1.75	1.03[4]	2.78
Hardwood	2.25	1.38[5]	3.63
	100 Lin. Ft.	100 Lin. Ft.	100 Lin. Ft.
BASE AND SHOE			
Softwood	$10.00	$9.28[6]	$19.28
Hardwood	16.00	11.00[7]	26.00
PICTURE MOLDING	3.00	5.50[8]	8.50
	Per Flight	Unit	Unit
STAIRS			
Cellar (12 risers)	$8.00	$11.00[7]	$19.00
Box (16 risers)	16.00	22.00[9]	38.00
Newel and rail	125.00	125.13[10]	250.13
			Unit
CUPBOARDS AND CLOSETS			
Kitchen[11]			$15–$20
China (corner)[12]			40– 60

[1] Overhead not included.
[2] Based on 1¼ labor hours.
[3] Based on 2 labor hours.
[4] Based on ¾ labor hours.
[5] Based on 1 labor hour.
[6] Based on 6¾ labor hours.
[7] Based on 8 labor hours.
[8] Based on 4 labor hours.
[9] Based on 16 labor hours.
[10] Based on 91 labor hours.
[11] Per unit, 3–8 labor hours.
[12] Per unit, 6–8 labor hours.

HOLLOW CLAY TILE

Load-bearing Tile	Retail M. pcs.	Labor Cost[1] 100 Sq. Ft.	Total Cost[2] 100 Sq. Ft.
Natco (6 x 12 x 12″)	$168.30	$10.71[3]	$31.68
Natco (8 x 12 x 12″)	202.00	11.67[4]	35.89
Natco (10 x 12 x 12″)	249.70	14.94[5]	44.43
Natco (12 x 12 x 12″)	309.10	16.57[6]	54.75

Correction Factors	Labor Variation for Each 5c Change in Scale	
	Mason	Helper
Natco (6 x 12 x 12″)	$.21	$.20
Natco (8 x 12 x 12″)	.24	.20
Natco (10 x 12 x 12″)	.31	.25
Natco (12 x 12 x 12″)	.36	.25

[1] Labor cost includes mason at $1.62½ and helper at $.97½ per 100 sq. ft., exclusive of overhead.
[2] Total cost for 100 square feet in place includes labor, material, allowances for centering, mortar but no overhead or profit.
[3] Based on 4⅕ mason hours and 4 labor hours at 175–200 sq. ft. placed in 8 hours.
[4] Based on 4⅘ mason hours and 4 labor hours at 160–180 sq. ft. placed in 8 hours.
[5] Based on 6⅕ mason hours and 5 labor hours at 120–140 sq. ft. placed in 8 hours.
[6] Based on 7⅕ mason hours and 5 labor hours at 100–120 sq. ft. placed in 8 hours.

Development of United States Housing Corporation, Norfolk, Va.

Specification	Mortar[1] Joints (½″) Per M	Labor Cost[2] Per M	Total Cost Per M	For Each 10% Variation in Mortar Cost	For Each 5% Variation in Labor Cost	
				Material	Mason	Labor
COMMON BRICK @ $14.00 per M						
Lime	$4.28	$19.83[3]	$38.11	$.43	$.40	$.35
Cement	5.83	22.39[4]	42.22	.58	.45	.39
FACE BRICK (9″ Wall) @ $35.00 per M						
Lime (common bond)	4.28	31.36[5]	70.60	.43	.73	.40
Cement (common bond)	5.83	35.75[6]	76.58	.58	.80	.50
4″ BRICK VENEER (Metal Ties, Wood Structures) @ $35.00 per M						
Lime (common bond)	4.28	32.61[7]	71.89	.43	.76	.40
Cement (common bond)	5.83	36.97[8]	77.50	.58	.84	.50

Variations in Face Brick	Labor Costs Per M Brick	
	Lime	Cement
For Other than Struck Joints		
Cut joints, common bond, deduct	$4.06	$3.25[9]
V-joints, common bond, deduct	.81	.81
Raked joints, rough, common bond, deduct	1.21	1.21
Raked joints, smooth, common bond, add	.81	2.44
For Other than Common Bond:		
Cut joints, add	4.06	4.06
V-joints, add	1.62½	3.25
Raked joints, rough, add	2.83	1.21
Raked joints, smooth, add	6.50	6.50

Estimating Data: Number of brick required for 1 square foot of wall for each brick 4″–4½″ in thickness.

Size of Brick in Inches	Thickness of Mortar Joints			
	¼″	⅜″	½″	⅝″
8 x 3¾ x 2¼″ (standard)	7″	6½″	6¼″	5¾″
8¼ x 4 x 2¼″	6¼″	6½″	6″	5¾″
8¼ x 4 x 2½″	6¼″	5¾″	5½″	5¼″
8½ x 4⅛ x 2½″	6″	5¾″	5¼″	5″
8½ x 4⅜ x 2⅜″	5½″	5″	4¾″	4½″

To lay 1,000 brick in lime and sand mortar requires: .62 cu. yds. of sand, 1.25 bbl. of lime.

To lay 1,000 brick in 1:3 cement and sand mortar requires: .62 cu. yds. of sand, 1.8 bbl. of cement.

[1] Cost of mortar based on these prices:

Sand, $1.85 per cu. yd.
Lime, $2.50 per bbl.
Cement, $2.60 per bbl.

[2] Labor cost includes masonry at $1.62½ and labor at $.97½ per M, exclusive of overhead.

[3] Based on 8 mason hours and 7 labor hours, 1,000 brick per man.

[4] Based on 9 mason hours and 7¾ labor hours, 900 brick per man.

[5] Based on 14½ mason hours and 8 labor hours, 500–600 brick per man.

[6] Based on 16 mason hours and 10 labor hours, 450–550 brick per man.

[7] Based on 15¼ mason hours and 8 labor hours, 500–550 brick per man.

[8] Based on 16¾ mason hours and 10 labor hours, 450–500 brick per man.

[9] For 4″ brick veneer, cement mortar, deduct $2.44 instead.

For Roman brick (size 12 x 4 x 2″) add 40–50% to the mason hours given for standard size brick. For English size brick (9 x 4½ x 3″) add 10–15% to the mason hours given for standard size brick. For vitrified brick add 3–3½ hours to the mason hours given for standard size brick.

For special work (the following table gives the number of brick laid by one mason in 8 hours:)

Arches	100–125
Piers (4–6 brick in length)	300–350
Cleaning	350–500 sq. ft.

For brick flues and chimney (the following table gives the number of brick laid by one man in 8 hours):

Flue (9 x 9–9 x 13)	700
Chimneys	600

Lath	Material 100 Sq. Yd.	Labor Cost 100 Sq. Yd.	Total Cost 100 Sq. Yd.
Wood	$10.15[1]	$13.00[4]	$23.15
Metal	21.67[2]	16.25[5]	37.92
Plaster Board	23.96[3]	12.50[6]	36.46

[1] Wood lath, $6.50 (M.); nails, $0.04 (lb.).
[2] Metal lath, $0.19½ (sq. yd.); staples, $0.08 (lb.).
[3] Plaster board, 950 sq. ft. at $24.80 (M. ft.); nails, $0.04 (lb.).
[4] Based on 8 hours at $1.62½.
[5] Based on 10 hours at $1.62½.
[6] Based on 10 hours at $1.25.

Material Prices per Unit:		
Sand	(cu.yd.)	$1.85
Lime, hydrated	(bbl.)	2.50
Plaster of paris	(100 lb.)	1.00
Hair	(bu.)	.65
Fiber	(bu.)	.65
Hard plaster, neat	(100 lb.)	.75
Cement	(bbl.)	2.60

Estimating Data:

Lime Mortar	Grounds (In.)	Lime (Bbl.)	Sand (Cu. Yd.)	Plaster of Paris (Lb.)	Hair and Fiber (Bu.)
2 Coats, White Finish[1]					
On wood lath	⅝	3½	1¼	100	3
On tile	⅝	4	1½	100	3
On plaster board	⅞	3½	1¼	100	3
3 Coats, White Finish					
On wood lath	¾	4½	1½	100	3
On metal lath	¾	6	2⅛	100	4½
On tile	¾	6½	2	100	3

Hard Wall Plaster	Grounds (In.)	Hard Wall (Lb.)	Lime (Bbl.)	Plaster of Paris (Lb.)	Sand (Cu. Yd.)
2 Coats, White Finish[3]					
On wood lath	⅝	900	1½	100	1
On plaster board	⅝	800	1½	100	¾
On tile	⅝	1500	1½	100	1¾
3 Coats, White Finish[3]					
On wood lath	¾	1200	1½	100	1⅙
On plaster board	¾	800	1½	100	⅞
On tile	¾	1800	1½	100	2
On metal lath	¾	1400	1½	100	1½

Keene's Cement	Grounds (In.)	Coats	Plaster or Cement (Lb.)	Lime Hyd. (Lb.)	Sand (Cu. Yd.)	Hair and Fiber (Bu.)
Smooth Finish[2]						
On tile	⅝	2	800	350	1½	1
On wood lath	⅞	3	900	450	1½	1
On metal lath	¾	3	900	450	1½	1

Portland Cement	Grounds (In.)	Coats	Cement (Bbl.)	Lime (Bbl.)	Sand (Bbl.)
On metal lath	¾	3	6	1½	2½
On wood lath	¾	2	4½	1	1¾

[1] If it is desired to substitute sand finish for white finish, add 100 lbs. plaster of paris, ¼ yd. of sand and deduct 1½ bbl. of lime.
[2] For hard finish add 100 lbs. cement. For sand finish deduct 200 lbs. cement and add ⅓ cu. yds. of sand.
[3] For sand finish make additions and deductions as shown in preceding table, lime mortar.

INTERIOR PLASTERING (Lime Mortar)

Specification	Material 100 Sq. Yds.	Labor Cost[1] 100 Sq. Yds.	Total Cost 100 Sq. Yds.	Labor Variation for Each 5c Change in Scale	
				Plasterer	Tender
2 coats, 5/8" grounds, on wood lath—					
(1) White	$14.01	$34.19[2]	$48.20[12]	$0.78	$0.50
(2) Sand	11.72	36.71[3]	48.43	.83	.55
2 coats, 7/8" grounds, on tile—					
(1) White	15.73	36.71[3]	52.44	.83	.55
(2) Sand	13.44	39.24[4]	52.68	.88	.60
2 coats, 5/8" grounds, on plaster board					
(1) White	14.01	29.14[5]	45.68[13]	.68	.40
(2) Sand	11.72	31.67[6]	43.39	.73	.45
3 coats, 3/4" grounds, on wood lath—					
(1) White	16.96	46.81[7]	63.77[14]	1.03	.75
(2) Sand	14.87	49.34[8]	64.21	1.08	.80
3 coats, 3/4" grounds, on metal lath—					
(1) White	22.85	47.71[9]	70.56[15]	1.03	.75
(2) Sand	20.56	50.24[10]	70.80	1.08	.80
3 coats, 3/4" grounds, on brick or tile—					
(1) White	15.80	49.34[8]	65.14	1.08	.80
(2) Sand	13.51	51.87[11]	65.38	1.13	.85

[1] Labor cost includes plasterer at $1.62½ and tender at $.90, exclusive of overhead.
[2] Based on 15½ plasterer hours and 10 tender hours.
[3] Based on 16½ plasterer hours and 11 tender hours.
[4] Based on 17½ plasterer hours and 12 tender hours.
[5] Based on 13½ plasterer hours and 8 tender hours.
[6] Based on 14½ plasterer hours and 9 tender hours.
[7] Based on 20½ plasterer hours and 15 tender hours.
[8] Based on 21½ plasterer hours and 16 tender hours.
[9] Based on 20½ plasterer hours and 16 tender hours.
[10] Based on 21½ plasterer hours and 17 tender hours.
[11] Based on 22½ plasterer hours and 17 tender hours.
[12] Add $23.15 to obtain complete cost of lath and plaster.
[13] Add $36.46 to obtain complete cost of plaster board and plaster.
[14] Add $23.15 to obtain complete cost of lath and plaster.
[15] Add $37.92 to obtain complete cost of lath and plaster.

Keene's Cement

Specification	Material 100 Sq. Yd.	Labor Cost[1] 100 Sq. Yd.	Total Cost 100 Sq. Yd.	Labor Variation for Each 5c Change in Scale	
				Plasterer	Tender
2 coats, 5/8" grounds, on tile—					
(1) Smooth	$20.58	$43.30[2]	$63.88	$1.00	$0.60
(2) Hard	19.13	43.30[2]	62.43	1.00	.60
(3) Sand floor	19.10	49.80[3]	69.90	1.20	.60
3 coats, 3/4" grounds, on metal lath— 3 coats, 7/8" grounds, on wood lath—					
(1) Smooth	24.26	54.63[4]	78.89[6]	1.23	.83
(2) Hard	23.06	54.63[4]	77.69	1.23	.83
(3) Sand floor	23.65	61.16[5]	84.81	1.43	.83

[1] Labor cost includes plasterer at $1.62½ and tender at $.90, exclusive of overhead.
[2] Based on 20 plasterer hours and 12 tender hours.
[3] Based on 24 plasterer hours and 12 tender hours.
[4] Based on 24½ plasterer hours and 16½ tender hours.
[5] Based on 28½ plasterer hours and 16½ tender hours.
[6] Add $37.92 metal lath or $23.15 wood lath to obtain complete cost of lath and plaster.

Hard Wall Plaster

Specification	Material 100 Sq. Yd.	Labor Cost[1] 100 Sq. Yd.	Total Cost 100 Sq. Yd.	Labor Variation for Each 5c Change in Scale	
				Plasterer	Tender
2 coats, 5/8" grounds, on wood lath—					
(1) White	$13.35	$36.35[2]	$50.70[8]	$0.80	$0.58
(2) Sand	10.56	38.88[3]	49.44	.85	.63
2 coats, 5/8" grounds, on plaster board—					
(1) White	12.14	36.35[2]	48.49[9]	.80	.58
(2) Sand	9.35	38.88[3]	48.23	.85	.63
2 coats, 1/2" grounds, on brick or tile—					
(1) White	19.24	38.88[3]	58.12	.85	.63
(2) Sand	16.45	41.36[4]	57.81	.90	.68
3 coats, 3/4" grounds, on wood lath—					
(1) White	15.91	48.98[5]	64.89[10]	1.05	.83
(2) Sand	13.12	51.51[6]	64.63	1.10	.88
3 coats, 3/4" grounds, on plaster board—					
(1) White	12.37	48.98[5]	61.35[11]	1.05	.83
(2) Sand	9.58	51.51[6]	61.09	1.10	.88
3 coats, 3/4" grounds, on tile—					
(1) White	21.95	51.50[6]	73.45	1.10	.88
(2) Sand	19.16	54.03[7]	73.19	1.15	.93
3 coats, 3/4" grounds, on metal lath—					
(1) White	21.32	52.77	74.09[12]	1.13	.90
(2) Sand	18.53	55.30	73.83	1.18	.95

[1] Labor cost includes plasterer at $1.62½ and tender at $.90, exclusive of overhead.
[2] Based on 16 plasterer hours and 11½ tender hours.
[3] Based on 17 plasterer hours and 12½ tender hours.
[4] Based on 18 plasterer hours and 13½ tender hours.
[5] Based on 21 plasterer hours and 16½ tender hours.
[6] Based on 22 plasterer hours and 17½ tender hours.
[7] Based on 23 plasterer hours and 18½ tender hours.
[8] Add $23.15 to obtain complete cost of lath and plaster.
[9] Add $36.46 to obtain complete cost of plaster board and plaster.
[10] Add $23.15 to obtain complete cost of lath and plaster.
[11] Add $36.46 to obtain complete cost of plaster board and plaster.
[12] Add $37.92 to obtain complete cost of metal lath and plaster.

Portland Cement

Specification	Material 100 Sq. Yd.	Labor Cost[1] 100 Sq. Yd.	Total Cost 100 Sq. Yd.	Labor Variation for Each 5c Change in Scale	
				Plasterer	Tender
3 coats, 3/4" grounds, on metal lath— Plain finish	$25.23	$75.77[2]	$101.00[5]	$1.75	$1.05
2 coats, 3/4" grounds, on wood lath— Plain finish	19.35	61.75[3]	81.10[6]	1.30	.60
3 coats, 7/8" grounds, on wood lath— Plain finish	17.21	72.35[4]	89.56	1.70	.95

[1] Labor cost includes plasterer at $1.62½ and tender at $.90, exclusive of overhead.
[2] Based on 35 plasterer hours and 21 tender hours.
[3] Based on 26 plasterer hours and 12 tender hours.
[4] Based on 34 plasterer hours and 19 tender hours.
[5] Add $37.92 to obtain complete cost of lath and plaster.
[6] Add $23.15 to obtain complete cost of lath and plaster.

EXTERIOR PLASTERING (Portland Cement)

Portland Cement	Material[1] 100 Sq. Yd.	Labor Cost[2] 100 Sq. Yd.	Total Cost 100 Sq. Yd.
2 coats, 5/8" thick, on wood lath, brick or tile— Plain finish	$23.20	$49.06[3]	$72.26
3 coats, 3/4" thick, on wood lath, brick or tile— Plain finish	25.15	80.45[4]	105.60
3 coats, 3/4" thick, on metal lath— Plain	28.66	84.24[5]	112.90
Stonecote—Oriental Stucco,[9] 3 coats on metal lath			
(1) Scratch coat	46.55[10]	21.46[6]	68.01
(2) Brown coat	62.50[11]	23.99[7]	86.49
(3) Floor finish	50.00[12]	35.00[8]	85.00
(4) Total plastering	.....	....	239.50

Variations for Each 5c per bbl. of Cement and cu. yd. of Sand, and 5c in Hourly Rates		
Materials	Plasterer	Tender
$0.47	$1.02½	$0.87½
.53	1.70	1.40
.59	1.77½	1.47½

[1] Cost of materials: cement at $2.60 per bbl. and sand at $1.85 per cu. yd.

[2] Labor cost includes plasterer at $1.62½ and tender at $.90, exclusive of overhead.

[3] Based on 20½ plasterer hours and 17½ tender hours.

[4] Based on 34 plasterer hours and 28 tender hours.

[5] Based on 35½ plasterer hours and 29½ tender hours.

[6] Based on 8½ plasterer hours and 8½ tender hours.

[7] Based on 9½ plasterer hours and 7½ tender hours.

[8] Based on 16 plasterer hours and 10 tender hours.

[9] Portland cement stucco; base ready-mixed; colored finish.

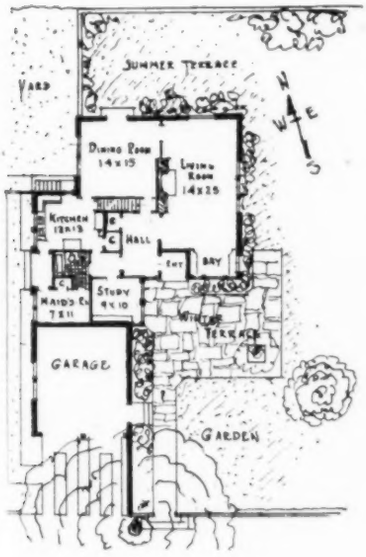
[10] Based on 3,500 lbs. at $1.33 per 100.

[11] Based on 2,500 lbs. at $2.50 per 100.

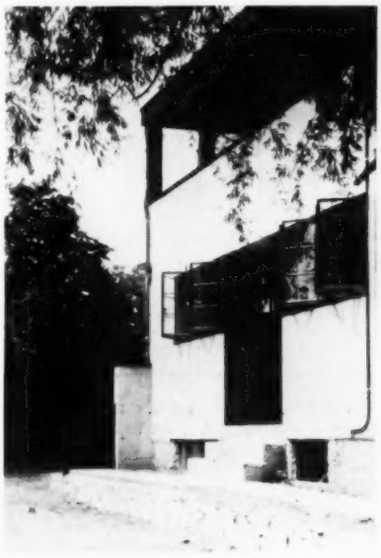
[12] Based on 2,000 lbs. at $2.50 per 100.

Estimating Data:

Portland Cement	Thickness (In.)	Coats	Cement (Bbl.)	Sand (Cu. Ft.)
On wood lath, brick or tile	5/8	2	7½	54
On wood lath, brick or tile	3/4	3	8¼	54
On metal lath	3/4	3	9½	58



Plan of house for Dr. J. M. Schweitzer, Riverdale, New York. R. C. Weinberg, architect.



Exterior, house for Dr. J. M. Schweitzer, Riverdale, New York. R. C. Weinberg, architect.

Western Red Cedar Shingles	Exposure (In.)	No. Units with Waste	Skilled Laborers[1] (Hours)	Common Laborers[1] (Hours)	Material Cost Per Square	Labor Cost[6] Per Square	Average Price[7] Per Square
Wood Shingles—	4	971	2.5–3.5	0.5–1	$5.34[2]	$4.93	$10.27
5/2 Extra Clear	4½	863	2.3–3.3	0.5–1	4.74	4.65	9.39
(Roofs and Walls)	5	782	2.0–3.0	0.5–1	4.30	4.24	8.54
Wood Shingles—	4	971	2.5–3.5	0.5–1	6.99[3]	4.58	11.57
Eurekas (Roofs)	4½	863	2.3–3.3	0.5–1	6.21	4.33	10.54
	5	782	2.0–3.0	0.5–1	5.63	3.95	9.58
	5½	710	1.9–2.9	0.5–1	5.11	3.83	8.94
	6½	599	1.6–2.6	0.5–1	4.31	3.45	7.76
Wood Shingles—	6	650	3.0–4.0	0.5–1	5.43[4]	5.61	11.04
Perfections	7	556	2.5–3.5	0.5–1	4.73	4.93	9.66
(Walls)	7½	519	2.4–3.4	0.5–1	4.41	4.79	9.20
	8	486	2.3–3.3	0.5–1	4.13	4.65	8.78
Wood Shingles—	6	650	4.0	1	11.70[5]	6.30	18.00
Royals (Walls)	7	556	3.5	1	10.00	5.61	15.61
	7½	519	3.5	1	9.34	5.61	14.95
	8	486	3.3	1	8.66	5.34	14.00

[1] Where two figures are given in the labor column, the first figure represents a simple gable roof and the second a complicated roof with dormers.
[2] Based on retail price of $5.50 per 1,000.
[3] Based on retail price of $7.20 per 1,000.
[4] Based on retail price of $8.50 per 1,000.
[5] Based on retail price of $18.00 per 1,000.
[6] Carpenter, $1.37½ per hour; labor, $0.80 per hour, exclusive of overhead.
[7] Dipping ⅔ length in stain, using 2½–3 gals. Stain per thousand; entire length 3–3½ gals; labor about ½ hour, shingles dipped in bunches. Factory stained shingles will cost about $5 more per square than the natural shingles.

Clay Tile Roofing	Roofer (Hours)	Helper (Hours)	Total Cost[1] 100 Sq. Ft. Laid
Red, unglazed—			
(1) Spanish, plain surface	5–8	5–8	$32–38
(2) Flat or shingle tile	6–9	6–9	30–36

[1] The prices given are for plain gable roofs. For red tile roofs unglazed: add 10% for hip roofs; 30% for dormers.

Asbestos Fiber and Portland Cement Shingles[1]	Material Cost[2] 100 Sq. Ft.		
American Method 8″ x 16″ x 3/8″ 7″ to Weather	Gray	Red, Purple, Brown, Buff	Black
(1) Plain Butts	$13.04	$15.60	$17.52
(2) Rough Butts	16.34	18.80	20.72

[1] Mohawk Asbestos Slate Co., Utica, N. Y.
[2] Total cost, laid, $20 a square and up. Random widths 6″, 8″, 10″, 16″: add $3 per square. Ridge and Hips, length 16″, exposed 13″, 93 sections per 100 lin. ft.: grays, $0.15 per section; colors, $0.24 per section. Saddle Hip Tile, exposed 4½″, approximately 3 pieces per lin. ft.: grays, $0.20 per section; colors, $0.24 per section.

ROOFING

Slate Roofing	Exposure (In.)	Nails	Retail Price	Roofer[1] (Hrs.)	Helper[1] (Hrs.)	Material Cost 100 Sq. Ft.	Labor Cost[2] 100 Sq. Ft.	Total Cost[3] 100 Sq. Ft.
Bangor Ribbon Medium[4]								
(a) 3/16 x 24 x 12"	10½	1.2	$8.12[4]	3	3	$14.03	$6.53	$22.15
(b) 3/16 x 22 x 12"	10½	1.25	8.12	3	3	14.03	6.53	22.15
(c) 3/16 x 20 x 12"	8½	1.25	8.55	3	3	14.46	6.53	23.01
(d) 3/16 x 18 x 10"	8½	1.9	9.45	3	3	15.36	6.53	24.81
(e) 3/16 x 18 x 12"	7½	1.60	8.55	3	3	14.46	6.53	23.01
(f) 3/16 x 16 x 10"	6½	2.25	9.45	3	3	15.36	6.53	24.81
(g) 3/16 x 14 x 10"	5½	2.60	9.45	3½	3½	15.36	7.62	24.81
(h) 3/16 x 14 x 8"	5½	3.75	9.45	3½	3½	15.36	7.62	24.81

[1] Labor hours given are high for plain, large surfaces but provide for an average amount of hips and valleys, also for laying of felt.
[2] Wage scale: Roofer, $1.37½; helper, $.80; overhead not added.
[3] Total cost includes slate, nails, felt, cement, unloading and hauling slate.
[4] For Genuine Washington Big Bed No. 2 Clear: (a) $7.65; (b) $7.65; (c) $8.10. For No. 1 Clear: (a) $8.10; (b) $9.68; (c) $10.35; (d) $11.93; (e) $10.35; (f) $11.93; (g) $9.45; (h) $9.45. For Genuine Albion Medium: (a) $7.10; (d) $8.10; (f) $8.10; (h) $7.10. Prices are carloads at quarry; 10% added for less than 20 squares.

TILE

Clay-Tile Ceramics	Labor Hours Per 100 Sq. Ft.		Material Cost Sq. Ft. in Place
	Setter	Helper	
Floors:			
(1) White and colored, unglazed, ¾" to 1" round or hexagonal	7–9	7–9	$1.10–1.45
(2) White, unglazed, ¾" to 1" square	9–10	9–10	1.15–1.25
(3) White and colored, unglazed, 2" and 3" square	12–16	12–16	1.40–1.60
Walls:			
(1) Bright-glazed colored wall tile, 4" and 6" square	11–13	11–13	1.50–2.00[1]
(2) Matt-finish wall tile, 4" and 6" square	11–13	11–13	1.50–2.00

[1] Wall tile price per sq. ft. includes base and cap.

PLUMBING

Fixtures	Average Cost Per Fixture[1]
Lavatory	$50.00
Water closet	40.00
Bath tub	141.00
Kitchen sink	75.00
Laundry tubs	100.00

[1] For colored fixtures add 20% to the above prices. To estimate the cost of plumbing, take the total cost of fixtures X 2 plus 10%.

PAINTING

Specification	Labor Hours 500 Sq. Ft.	Labor Cost[1] 500 Sq. Ft.	Total Cost 500 Sq. Ft.
Exterior:			
(1) Walls and trim (one coat)	7¼	$9.97	$12.97[2]
(2) Walls and trim (three coats)	21¾	29.91	38.91[2]
Interior			
(1) Walls and trim (one coat)	9	12.38	16.57[3]
(2) Walls and trim (two coats)	18	24.76	33.14[3]
(3) Varnishing floors (one coat)	4	5.50	10.50[4]

[1] Labor cost includes painter at $1.37½, exclusive of overhead.
[2] Based on 500 sq. ft. per gal. at $3.
[3] Based on 400 sq. ft. per gal. at $3.35.
[4] Based on 500 sq. ft. per gal. at $5.

METAL WORK

Specification	Material Cost 100 Lin. Ft.	Labor Cost[1] 100 Lin. Ft.	Total Cost 100 Lin. Ft.
Copper Gutters	$36	$18[2]	$54
Copper Leaders	38	18	56
Copper Flashing	$.30–$.40 per sq. ft.		

[1] Labor cost includes sheet metal worker at $1.50, exclusive of overhead.
[2] Based on 12 labor hours.

HEATING

System	Radiation Cost Per Sq. Ft.
Steam	$1.50–$2.50
Hot water	1.75– 2.50
Vapor	2.00– 2.50

Radiation cost per sq. ft. based on cast iron radiators.

ELECTRICAL

Average cost of fixtures, $150–$200

To estimate the cost of electrical work, take the total number of outlets X $5.

COMPARATIVE WALL CONSTRUCTION COSTS

Compiled by Weatherbest Stained Shingle Company

Wall Construction—16" shingles, 5 butts to 2", laid at 7½" exposure; building paper, sheathing, studs, wood lath and plaster.

Detail Cost per 100 Sq. Ft.	Quantity	Unit	Unit Cost	Total
Materials:				
Studs	.068	M Bd. Ft.	$42.00	$2.86
Sheathing	.120	M Bd. Ft.	32.00	3.84
Nails	8.7	Lb.	.04	.35
Building paper	110.00	Sq. Ft.	.003	.33
Shingles	⅔ Sq.	Sq.	12.00	8.00
Wood lath	.161	M	6.50	1.05
Gypsum plaster	151.	Lb.	.01	1.51
Sand	.133	Cu. Yd.	1.85	.25
Hydrated lime	32.	Lb.	.01	.32
Keene's cement	17.	Lb.	.02	.34
Labor:				
Carpenter	6.63	Hr.	1.37½	8.43
Laborer	2.2	Hr.	.70	1.54
Lather	.9	Hr.	1.62½	1.46
Plasterer	2.8	Hr.	1.62½	4.55
Helper	1.9	Hr.	.90	1.71
Foreman	1.03	Hr.	2.50	2.58
Total				$38.92

Wall Construction—Siding, building paper, sheathing, studs, wood lath and plaster.

Detail Cost per 100 Sq. Ft.	Quantity	Unit	Unit Cost	Total
Materials:				
Bevel siding	.143	M Bd. Ft.	$67.50	$9.65
Sheathing	.120	M Bd. Ft.	32.00	3.84
Studs	.068	M Bd. Ft.	42.00	2.86
Nails	7.6	Lb.	.04	.30
Building paper	110.	Sq. Ft.	.003	.33
Wood lath	.161	M	6.50	1.05
Gypsum plaster	151.	Lb.	.01	1.51
Sand	.133	Cu. Yd.	1.85	.25
Hydrated lime	32.	Lb.	.01	.32
Keene's cement	17.	Lb.	.02	.34
Paint	.8	Gal.	3.00	2.40
Labor:				
Carpenter	6.1	Hr.	1.37½	8.39
Laborer	1.0	Hr.	.70	.70
Lather	.9	Hr.	1.62½	1.46
Plasterer	2.8	Hr.	1.62½	4.54
Helper	1.9	Hr.	.90	1.71
Painter	1.9	Hr.	1.25	2.38
Foreman	1.17	Hr.	2.50	2.93
Total				$45.36

Wall Construction—Brick veneer, building paper, sheathing, studs, wood lath and plaster.

Detail Cost per 100 Sq. Ft.	Quantity	Unit	Unit Cost	Total
Materials:				
Studs	.068	M Bd. Ft.	$42.00	$2.86
Sheathing	.120	M Bd. Ft.	32.00	3.84
Nails	4.6	Lb.	.04	.23
Building paper	110.	Sq. Ft.	.003	.33
Wood lath	.161	M	6.50	1.05
Gypsum plaster	151.	Lb.	.01	1.51
Face brick	.655	M	35.00	22.92
Cement	.82	Bag	.65	.53
Lime	81.	Lb.	.01	.81
Sand	.383	Cu. Yd.	1.85	.71
Keene's cement	27.	Lb.	.02	.34
Brick ties	.98	Pc.	.02	1.96
Labor				
Carpenter	3.3	Hr.	1.37½	5.64
Laborer	.54	Hr.	.70	.38
Bricklayer	6.5	Hr.	1.62½	10.56
Helper	5.0	Hr.	.97½	4.88
Lather	.9	Hr.	1.62½	1.46
Plasterer	2.8	Hr.	1.62½	4.55
Helper	1.9	Hr.	.90	1.70
Foreman	1.38	Hr.	2.50	3.45
Total				$69.71

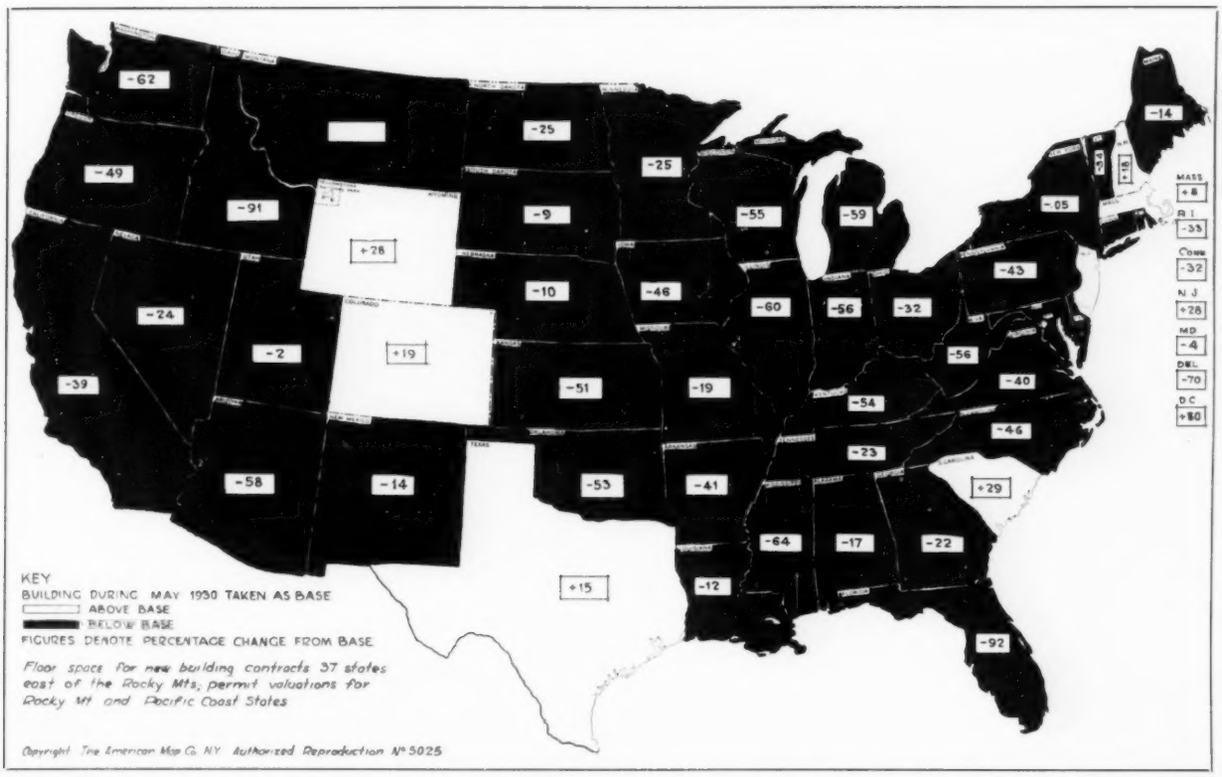
Wall Construction—Stucco and wood lath, building paper, sheathing, studs, wood lath and plaster.

Detail Cost per 100 Sq. Ft.	Quantity	Unit	Unit Cost	Total
Materials:				
Studs	.68	M Bd. Ft.	$42.00	$2.86
Wood lath	.161	M	6.50	1.05
Sheathing	.120	M Bd. Ft.	32.00	3.84
Stucco base	.105	M Bd. Ft.	51.00	5.35
Nails	7.	Lb.	.04	.28
Cement	2.96	Bags	.75	2.22
Sand	.495	Cu. Yd.	1.85	.92
Lime	93.	Lb.	.01	.93
Gypsum plaster	151.	Lb.	.01	1.51
Keene's cement	17.	Lb.	.02	.34
Hair	2.	Bu.	.65	1.30
Fiber	1.	Bu.	.65	.65
Labor:				
Carpenter	2.98	Hr.	1.37½	4.10
Laborer	.7	Hr.	.70	.49
Lather	1.8	Hr.	1.62½	2.93
Plasterer	6.56	Hr.	1.62½	10.66
Helper	5.33	Hr.	.90	4.80
Foreman	1.13	Hr.	2.50	2.83
Total				$47.06

Wall Construction—Stucco, hollow tile and plaster.

Detail Cost per 100 Sq. Ft.	Quantity	Unit	Unit Cost	Total
Materials:				
Hollow tile	100.	Pc.	$0.202	$20.20
Cement	5.96	Sacks	.65	3.87
Hydrated lime	53.00	Lb.	.01	.53
Sand	1.02	Cu. Yd.	1.85	1.89
Gypsum plaster	118.	Lb.	.01	1.18
Keene's cement	17.	Lb.	.02	.34
Labor				
Mason	5.00	Hr.	1.62½	8.13
Helper	5.	Hr.	.97½	4.88
Plasterer	13.12	Hr.	1.62½	21.32
Helper	9.65	Hr.	.90	8.69
Foreman	1.8	Hr.	2.50	4.53
Total				$75.56

HOUSE OF DR. J. M. SCHWEITZER, RIVERDALE, N. Y.
R. C. WEINBERG, ARCHITECT



The May building map showed six states where the current contract record was larger than in May 1930: New Hampshire, Massachusetts, New Jersey, District of Columbia, South Carolina and Texas. In this respect the May map was somewhat less favorable than the April map which showed seven states ahead of April 1930.

New Jersey was the only state reporting a gain in April which showed continued improvement in May. In the case of New York the shifting in May from the side of gain to the side of loss was disappointing.

BUILDING TRENDS AND OUTLOOK

CURRENT CONDITIONS

By L. Seth Schnitman

As is usual May showed a decline in construction contracts when contrasted with April; however, the loss between the two months was larger than is customary. The May contract total of $306,000,000 compared with a total of $337,000,000 for April and $457,000,000 for May 1930. The decline from last year amounted to 33 per cent, with each of the three major construction classes contributing to the general loss.

Relatively, residential building continued to fare better than either nonresidential building or public works and utilities. Contracts for new residential structures let during May were valued at $89,000,000 as contrasted with $96,000,000 for April and almost $117,000,000 for May 1930. The residential contract loss from a year ago of 24 per cent compares with a loss of 33 per cent in total construction. On a floor space basis May contracts for residential work showed a decline from a year ago of only 8 per cent as contrasted with a general building loss of about 27 per cent.

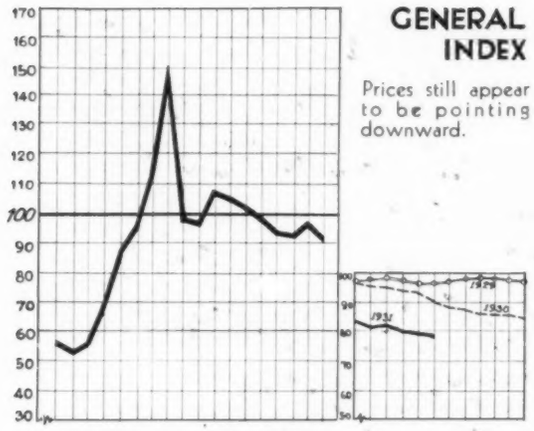
Nonresidential contracts awarded in May were slightly larger than the April awards. As contrasted with May 1930, however, this construction group showed a decline of about 43 per cent, due largely to losses in commercial, factory, and educational undertakings. Public buildings alone of all classes of nonresidential work showed an important gain over May 1930 awards. It was this class also that contributed a material offsetting influence to declines in other classes to leave the May total for the group as a whole somewhat larger than the April record. For the year to date nonresidential undertakings showed a decline from the corresponding period of 1930 of more than 42 per cent.

The metropolitan area of New York was alone of all the districts to report a gain over May 1930 in

(Continued on page 56, advertising section)

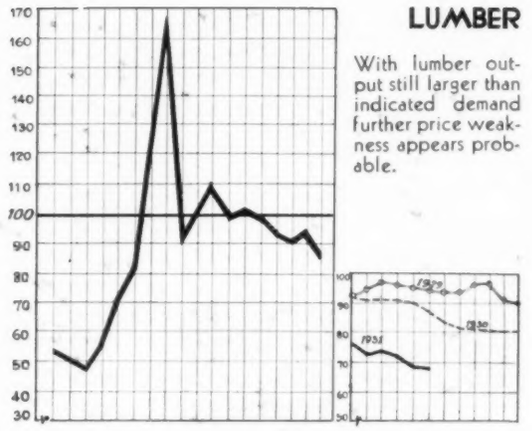
WHOLESALE PRICES FOR BUILDING MATERIALS

1926 Monthly Average = 100



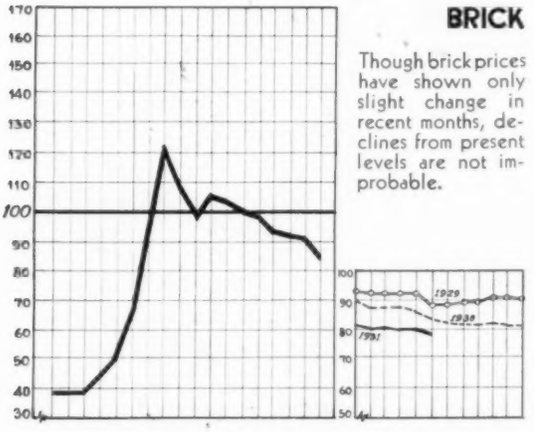
GENERAL INDEX

Prices still appear to be pointing downward.



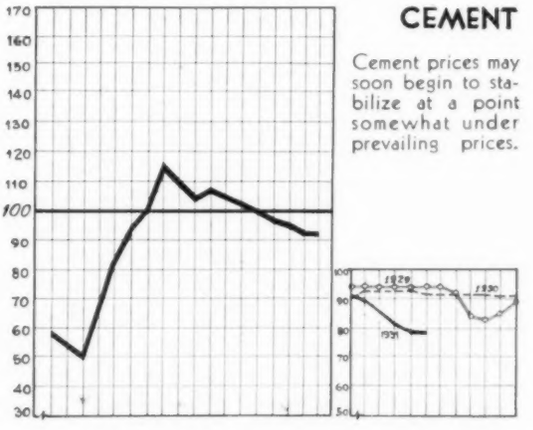
LUMBER

With lumber output still larger than indicated demand further price weakness appears probable.



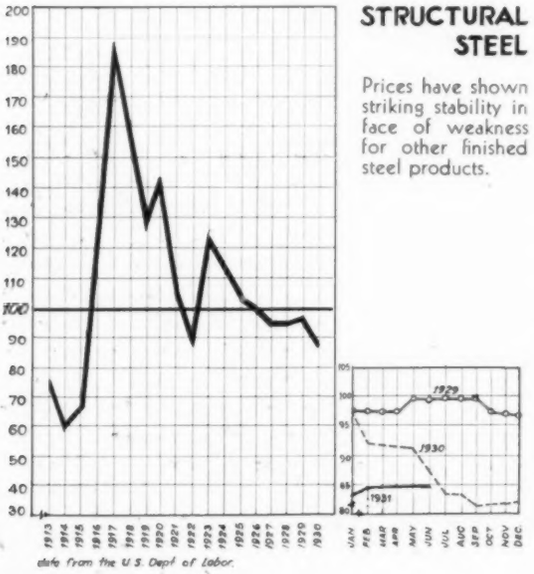
BRICK

Though brick prices have shown only slight change in recent months, declines from present levels are not improbable.



CEMENT

Cement prices may soon begin to stabilize at a point somewhat under prevailing prices.



STRUCTURAL STEEL

Prices have shown striking stability in face of weakness for other finished steel products.

OTHER MATERIALS

Further readjustments between prices for various materials will likely occur in ensuing months.

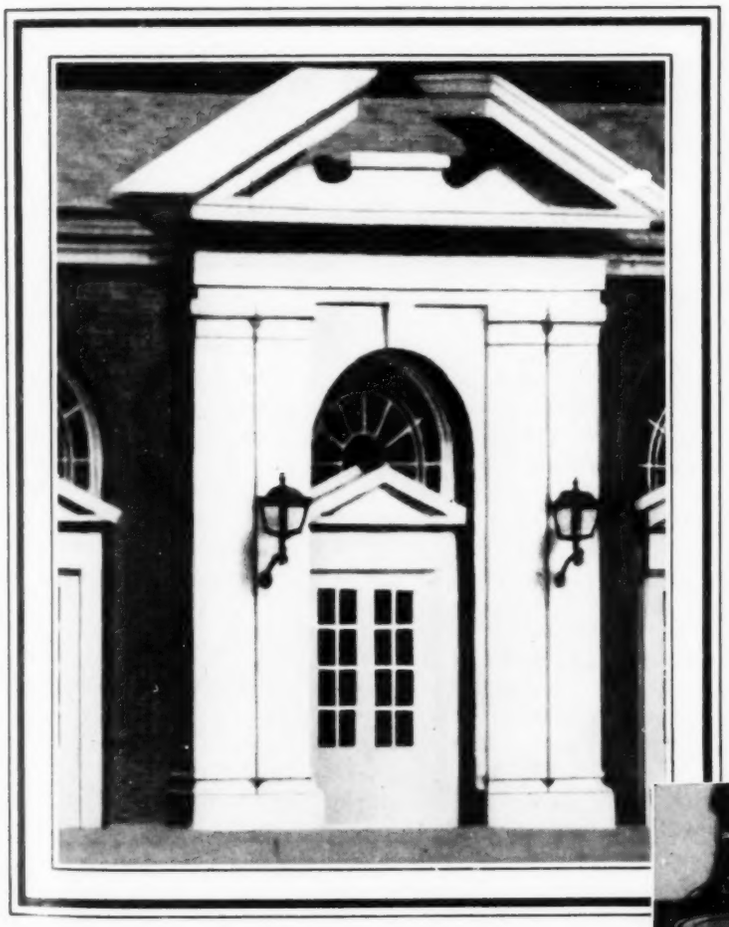
data from the U.S. Dept of Labor.

ARCHITECTS: ROBERT O. DERRICK, INC., DETROIT

The Edison Institute

FOUNDED BY Henry Ford

selects this Distinctive Paint



Public benefactor, manufacturing genius, patriot. That is Henry Ford. Now again he has earned high praise from all.

In his magnificent Edison Institute and Museum at Dearborn . . . dedicated at the Edison Light Jubilee in 1929 . . . he has collected many dramatic and historic relics of early America.

Visitors to these beautiful buildings of Colonial architecture often remark upon the handsome whiteness of the exterior trim . . . an effect attained by the use of Outside Barreled Sunlight.

* * * *

This supreme white paint is the crowning achievement of twenty years' specialization on white paint exclusively . . . the gratifying result of determination to produce the very finest exterior white paint we could make. You will be amazed at the rich, deep lustre, the satin smoothness of Outside Barreled Sunlight.

Outside Barreled Sunlight was developed by an adaptation of the famous Rice Process that produced the handsome, washable Interior Barreled Sunlight used on walls and woodwork in thousands of fine buildings.

Like Interior Barreled Sunlight, Outside Barreled Sunlight is an all-oil product, easy to tint with ordinary oil colors.

You will find our catalog in Sweets—but for your own files we would like to send you our booklet, "The Whitest White House in Town."

Write to U. S. Gutta Percha Paint Co., 22-G Dudley Street, Providence, R. I. Branches or distributors in all principal cities. (For Pacific Coast, W. P. Fuller & Co.)

In cans, 5-gallon buckets and large drums. Quantities of 5 gallons, or over, tinted to order without extra charge.

Outside Barreled Sunlight

REG. U. S. PAT. OFF.

(Continued from page 71, editorial section)

residential contracts. In the case of nonresidential building three districts—Upstate New York, Kansas City, and Texas—showed gains in May over last year, while the remaining ten territories reported losses. For public works and utilities five districts showed gains over May 1930—the Middle Atlantic, Pittsburgh, Central Northwest, Kansas City, and Texas territories.

Thus, though the general trend of construction still appears downward there are important local exceptions. In the past these local exceptions, particularly in respect to the Metropolitan New York territory, have signalized major turns in the general trend several months in advance. Whether the present conditions in this territory as regards residential building may now be foreshadowing a definite revival for the country at large is difficult to determine. At any rate we are now approaching that period of the year when comparisons, on a floor space basis, with the corresponding months of 1930 may be expected to look better so far as residential building goes.

May contracts for public works and utilities showed a loss of 18 per cent from April and 28 per cent from May 1930. The principal losses from last year occurred in bridge and highway undertakings though declines were rather general for most other types of civil engineering. For the first five months of the year civil engineering undertakings as a whole showed a decline of more than 19 per cent when contrasted with the corresponding period of 1930.

Metropolitan New York and Vicinity

For the metropolitan area of New York residential building continued to feature the contract record during May. This construction group alone showed May contracts larger than were reported during either the preceding month or May 1930. The increase over a year ago was solely due to larger contracts for single-family dwellings erected by housing developers; all other residential types showed important losses from May 1930. For the first five months of the current year residential contracts let in this territory totaled $159,000,000; this was an advance of more than 40 per cent as contrasted with the corresponding period a year earlier.

For nonresidential building the May record of somewhat less than $16,000,000 compares with almost $29,000,000 for April and $47,000,000 for May 1930. Losses from both periods were general except for public buildings which showed a gain over May 1930, and religious and memorial structures, where increases over both the preceding month and May 1930 were recorded. For the year to date nonresidential undertakings showed a decline of 54 per cent as contrasted with a loss in this construction group for the 37 eastern states, as a whole, of only 42 per cent.

Civil engineering undertakings for which contracts were let during May showed large losses from both the previous month and May of last year; but for increases in bridge and highway work the comparison with May 1930 would have been even more unfavorable. For the first five months of the current year civil engineering contracts were lower by 30 per cent than those reported during the same period of 1930.

Construction undertakings of all classes during May showed a loss of almost 26 per cent from April and 35 per cent from May 1930. For the first five months of the current year contracts totaled $432,000,000; this was a loss of 23 per cent in contrast with a cumulative loss from 1930 for the 37 eastern states as a whole of about 28 per cent.

Gains in construction over April were reported in the Bronx and Queens while the remaining three boroughs of New York City showed lower contract volumes. The Bronx showed a large gain over May 1930 while the other boroughs reported losses, with the decline in Manhattan amounting to 80 per cent. Yonkers and the remainder of Westchester County showed good increases in May as contrasted with a year ago. In Northern New Jersey all important cities except Elizabeth showed gains over May 1930.

For the first five months of 1931 undertakings in the Bronx were twice as large as those reported during the same period of 1930. Queens and Richmond boroughs also showed gains over last year, but Manhattan and Brooklyn showed declines. Increases over 1930 for the year to date were reported for Yonkers and Westchester County as a whole.

Permits in Rocky Mountain and West Coast Cities

Building permits granted during May in the principal cities on the west coast showed a further contraction when contrasted with the corresponding month of 1930. The declining trend has been almost uninterrupted since the beginning of 1926.

Sacramento alone, of the ten leading centers, showed a gain in May permits as compared with May 1930. Of the smaller reporting centers on the Pacific Coast, Alameda, Compton, and Stockton also showed gains over last year.

For the first five months of the current year gains over the corresponding period of 1930 were shown for San Francisco, Sacramento, and Spokane of all of the cities having 100,000 inhabitants or more; all other important cities showed cumulative losses for the period, with the largest recorded in Los Angeles and Seattle.

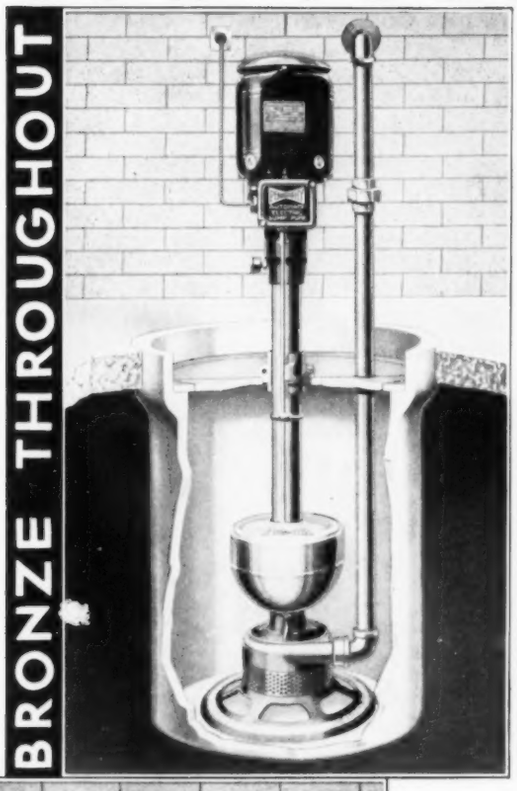
Of the remaining large cities showing declines the best relative position was reported by San Diego; here the cumulative loss from the first five months' total of 1930 was negligible.

Permits granted in May in the Rocky Mountain cities showed a loss from May 1930; gains for Denver, Pueblo, Ogden, and Cheyenne were insufficient to offset losses reported by Phoenix, Colorado Springs, Boise, Albuquerque, Reno, Butte, and Salt Lake City.

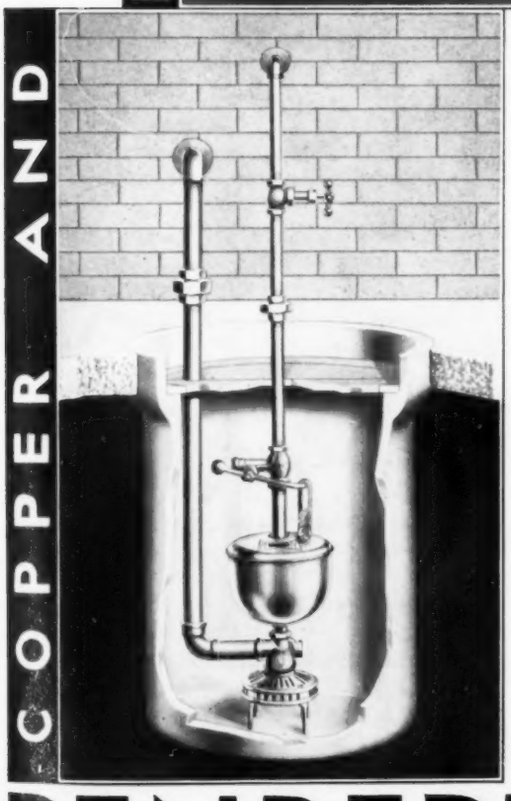
Denver and Salt Lake City, the only two large cities in this area, showed for the first five months of 1931 lower permit totals than were recorded in the corresponding period of 1930. The loss for Denver was only 7 per cent, while the decline for Salt Lake City was 22 per cent.

(Continued on page 58, advertising section)

A few reasons why— many Architects specify..



TRADE PENBERTHY PRODUCTS MARK



TO dispose of seepage below sewer level—or where sewerage facilities are not available—many architects prefer one of the units illustrated here. Local conditions determine whether the electric or hydraulic unit will be most economical—but both pumps have many characteristics that appeal to the architect.

Both the Penberthy Automatic Electric Sump Pump and the Penberthy Automatic Hydraulic Cellar Drainer are immune to corrosion—they are copper and bronze throughout. Both are thoroughly dependable under the most severe operating conditions, and are economical of electricity and water power. They are fool-proof, require no kid-glove handling, and are easy to install.

Manufacturing a complete line of both electric and hydraulic units in a full range of types and sizes, the Penberthy organization is especially well qualified to recommend the correct equipment for any specific case. Leading jobbers throughout the country stock both electric and hydraulic units.

PENBERTHY INJECTOR COMPANY

Established in 1886 — DETROIT — Canadian Plant Windsor, Ont.

PENBERTHY PUMPS REMOVE SEEPAGE WATER

(Continued from page 56, advertising section)

Money Rates, General Business, and Construction

Interest rates throughout May continued to show further weakening in reflection of sluggish business demands. As yet no tangible evidences are apparent to indicate that prevailing low money rates have operated to stimulate new business undertakings. This is especially true in the field of construction where the downward trend of contracts was further extended during May.

For the twelve months ended May 31, 1931, contracts for all types of construction awarded in the 37 states east of the Rocky Mountains totaled $3,962,000,000. This compares with $4,113,000,000 for the twelve-month period ended April 30, 1931, and $5,306,000,000 for the twelve months ended May 31, 1930. At the peak the contract total for the twelve-month period ended November 30, 1928, amounted to $6,673,000,000. Thus the contract total for the latest twelve months was lower than that for a year previous by 25 per cent while as contrasted with the peak period the current twelve month total was lower by 41 per cent.

The contract curve will show a further loss with the June record. At the same time further declines appear imminent in the trend of bank debits which represents the best available single index of the volume of commercial transactions. Both as to construction contracts and bank debits allowance must be made for the declines in the level of prices; with this factor in mind the current position of business is considerably better than is indicated by the dollar totals.

However, according to all precedents the rise and fall of construction contracts precede similar movements in business. Hence if precedent is to hold, an actual upturn in contracts is necessary before general business, as reflected by bank debits, starts upward.

NEW DEVICES FOR HOUSEHOLD USE*

By GAYNE T. K. NORTON

ASH RECEIVER

Ash Uplifter Co.

Makes removal of ashes from ash pit an easy, dustless task, keeping ash pit clear at all times. A regulation ash can is placed on an elevator and lowered into a pit under heater. Ashes are deposited directly into the can. When can is full, a few easy turns on elevator handle raises it to cellar floor level. Can is replaced with empty one which is lowered into place. Elevator handle is released and moved down to resting place and floor doors over pit are closed. May be used under any heater. Fireproof pit extends 14″ under heater. Heater foundation in no way disturbed. No interference with draft, natural or forced.

NON-MORTISE HINGE

McKinney Mfg. Co.

In place of solid leaves of usual mortise type hinge, unit has inter-fitting, cut-out leaves. Door cannot sag because all thrust and strain originated by weight or movement are evenly taken up by six positive shoulder contacts to door and jamb at each hinge. Accurate, uniform spacing between door and jamb insures balanced, correctly mounted installation all around, permitting necessary expansion of door on both lock and hinge side. Shoulder leaves are self-aligning. Made of cold rolled steel; all needed sizes, with various finishes and tips.

SASH PULLEY

The Stanley Works

Enclosed design with tube-like guide for cord or chain that prevents jamming, frayed cords, weights wedging between wheel and back of frame pocket, weight striking and bending wheel. Of wrought steel; completely closes pulley opening. Easy to thread without a mouse; supplements weatherstrip. Face plate may be painted without danger of gumming wheel. Wheel diameter 2″. Face plate 4⅛″ x 1″, 4½″ x 1″, 4½″ x 1⅛″. Wheel groove 4½″ x 1⅛″.

HOUSE NUMBER-MAIL CHUTE

Knapp Bros. Mfg. Co.

Built-in mail receiver with sharply inclined chute extending through house wall to inside wire basket. Hinged cover, draft proofing outside opening, forms background for house number or name of professional person; numerals or letters are raised white porcelain enamel cemented to plate; each is 2½″ high, visible 60′ away. Over outside installation is removable hood that protects 10-watt lamp which lights number and porch floor or steps. Light controlled from within; indicator on switch plate. Light should be 4′ above floor. Exterior installation, of solid bronze in classic design, 11″ x 7¾″. Galvanized iron chute painted inside and out.

*Compiled from information obtained from manufacturers.

IT HANGS TOGETHER

Here you see one of the reasons why Brixment mortar cuts bricklaying costs—*the mortar hangs together.* . . It doesn't break off and fall to the ground before the joint is struck. As a result, no mortar is wasted and the bricklayer stoops less often to the mortar board. It doesn't slop down over the face of the wall. So less time is required to clean down the finished job. . . This is due to the fact that the plasticity of Brixment mortar does not depend upon the use of excessive water. . . *The mortar hangs together.*

LOUISVILLE CEMENT COMPANY, *Incorporated,* LOUISVILLE, KY.

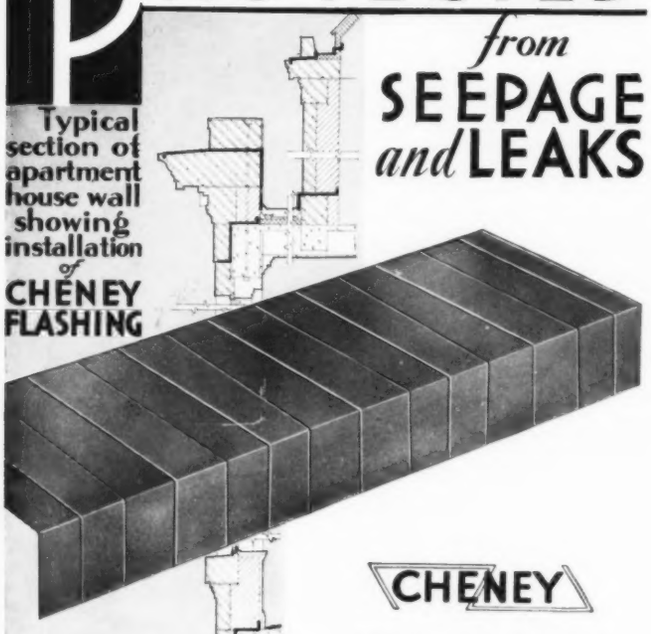
District Sales Offices: 1610 Builders Bldg., *Chicago;* 600 Murphy Bldg., *Detroit;* 101 Park Ave., *New York*

Mills: Brixment, N. Y. and Speed, Ind.

BRIXMENT

A Cement for Masonry and Stucco

PROTECTED *from* SEEPAGE *and* LEAKS



Typical section of apartment house wall showing installation of CHENEY FLASHING

CHENEY

INTERLOCKING THRU-WALL FLASHING PREVENTS SEEPAGE LEAKS AND EFFLORESCENCE

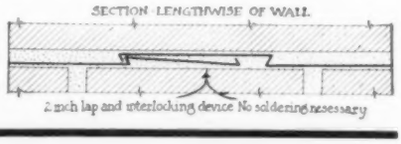
Runs Completely Thru the Masonry Wall.

≈

Forms a Positive Unbreakable Key-Bond in Every Direction within the Mortar Bed.

≈

Formed to Any Shape Desired



THE CHENEY COMPANY
WINCHESTER, MASSACHUSETTS
New York Chicago Philadelphia Pittsburgh
In Canada—Corporate Steel Products Limited, Montreal

TEMPERATURE REGULATOR

Stat-Amatic Instrument and Appliance Co.

Composed of three units: (1) Dual control thermostat provides one temperature for day and evening, and one for night. The change from one to the other is made automatically by the (2) motor-wound 15-jewel clock movement. (3) Motor operates drafts, valves or dampers as well as clock. When installed in a home that is unoccupied during the day, two extra "fingers" may be added to the clock dial; these, for example, will control temperature as follows: 7-8:15 A. M. 72°, 8:15 A. M. to 4 P. M. 64°, 4-10:30 P. M. 72°, 10:30 P. M. to 7 A. M. 64°. By means of program and astronomic dials and "fingers," temperature may be controlled for late rising on holidays or for week-end vacations, giving unlimited flexibility of heat regulation. Due to motor-wound clock, temperature control will not stop if current fails temporarily; clock will operate 3½ days after any current failure. Special dials referred to may be so connected as to automatically turn porch, drive, flood or other lights on or off in step with the variable length of the day throughout the year, to sound rising bells, close windows, start radio for getting-up exercises or turn on heaters in hard-to-heat rooms. Unit is suited to all forms of heating. Motor and accompanying gear trains require no greater headroom than valve. By placing motor directly on the valve and operating the lever of the valve directly, chains and pulleys are eliminated. A valve position indicator relay may be used to control automatically a gas-fired boiler, oil burner or stoker. This is so used that if any one valve in any part of the building is open, boiler, burner or stoker is started; if all valves are closed, the valve position indicators automatically shut off the heater.

OUTLET LOCKING RING

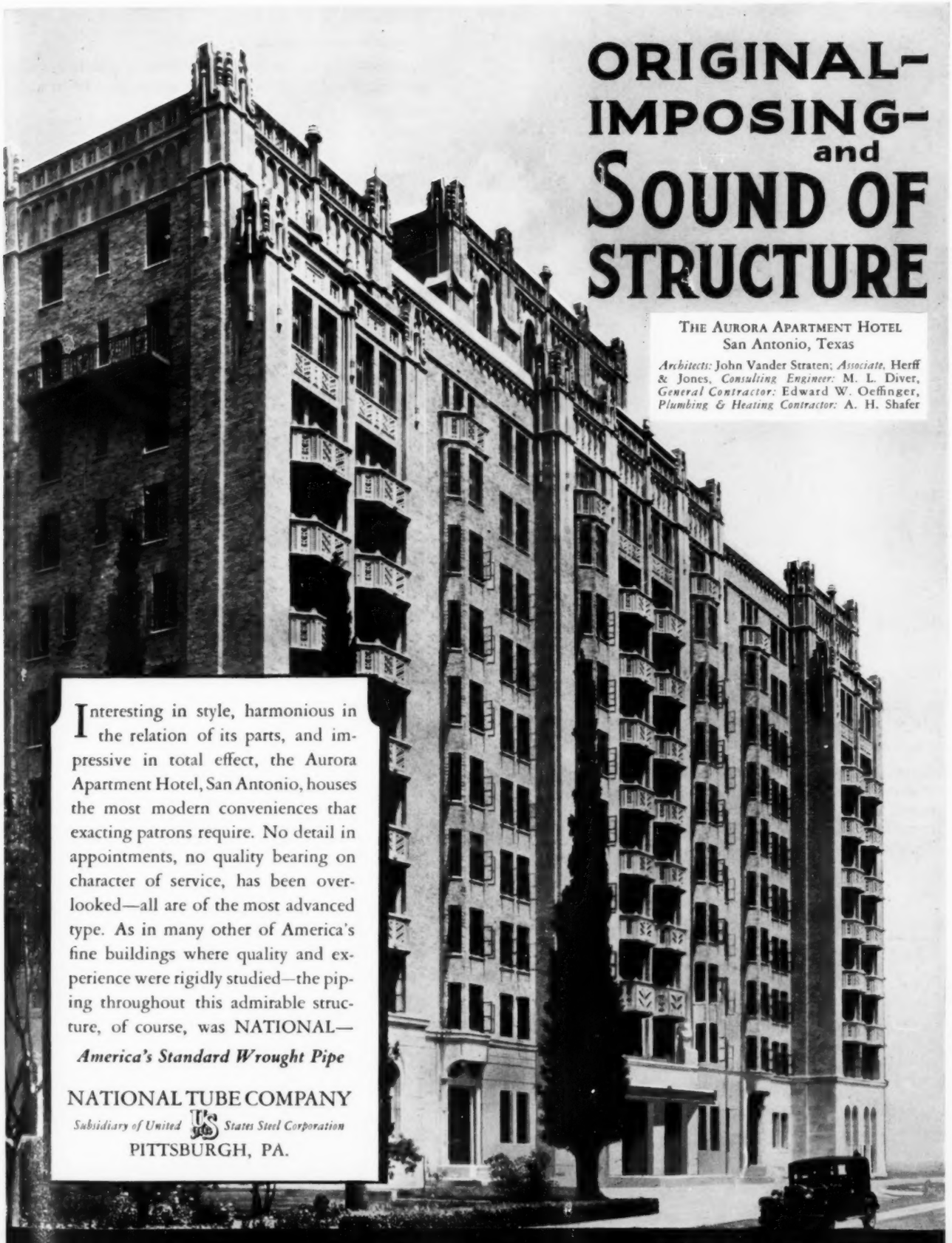
Arrow-Hart & Hegeman Electric Co.

For attachment to single outlets, makes permanent connection between cap and receptacle; twisting or pulling of cords will not break connection. Cap is easily locked or unlocked by a slight turn of swivel bracket.

ANTENNA ELIMINATOR

Bud Radio, Inc.

Applicable to all electric radios; outlet eliminates outside or inside aerial; placed in wall like any convenience outlet; 25′ wire and water pipe ground clamp attached. Aerial is contained in switchbox which is furnished with reversible ears to facilitate installation. Aerial capacity equals 50′ outside aerial. No lightning arrester needed. Fine selectivity and reduced interference promised. Plate measures 4½″ x 2¾″.



ORIGINAL—IMPOSING—and SOUND OF STRUCTURE

THE AURORA APARTMENT HOTEL
San Antonio, Texas

Architects: John Vander Straten; *Associate,* Herff & Jones, *Consulting Engineer:* M. L. Diver, *General Contractor:* Edward W. Oeffinger, *Plumbing & Heating Contractor:* A. H. Shafer

Interesting in style, harmonious in the relation of its parts, and impressive in total effect, the Aurora Apartment Hotel, San Antonio, houses the most modern conveniences that exacting patrons require. No detail in appointments, no quality bearing on character of service, has been overlooked—all are of the most advanced type. As in many other of America's fine buildings where quality and experience were rigidly studied—the piping throughout this admirable structure, of course, was NATIONAL—

America's Standard Wrought Pipe

NATIONAL TUBE COMPANY
Subsidiary of United States Steel Corporation
PITTSBURGH, PA.

NATIONAL PIPE

A NOTABLE STRUCTURE

CONTINENTAL LIFE BUILDING

•

ST. LOUIS

A striking addition to the St. Louis skyline. Robert W. Hunt Company inspected the structural steel at mill and shop and supervised its erection and also tested all cement, reinforcing bars and concrete cylinders.

Wm. B. Ittner, Inc., Architects, W. J. Knight & Co., Structural Engineers, J. A. Shaefer Const. Company and McCormack Combs Const. Company, Concrete Contractors.

For complete information about Hunt inspection, tests and supervision for buildings and structures see Sweet's Architectural Catalogues A-119 or write us.

ROBERT W. HUNT COMPANY

Engineers

Inspection — Tests — Supervision

Insurance Exchange

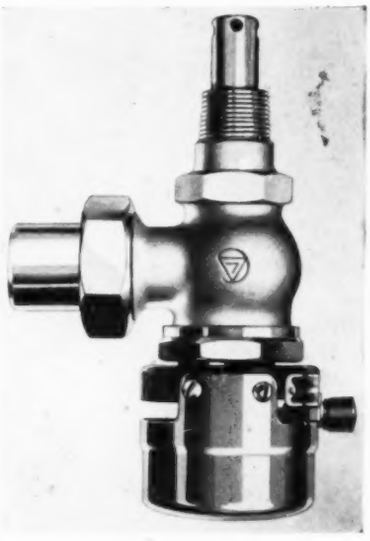
CHICAGO

All Large Cities

RADIATOR CONTROL

Radiatherm—American Radiator Co.

Combination thermostat and valve for automatically and independently controlling steam supply to each radiator on two-pipe steam, vapor or vacuum systems. Styles adapted to all types of radiation, with or without enclosures. Remote control types suited to intermittent steam supply. As long as an adequate heating system is in operation, individual room warmth is constantly maintained at any desired temperature.



Modustat—Minneapolis Honeywell Regulator Co.

A self-contained modulating radiator valve that holds temperature at desired level by gradually opening or closing in response to any change in room temperature. Small, finely finished, quickly attached.

INCINERATORS

Kerner Incinerator Co.

Requires no commercial fuel. Brick combustion chamber, fire-brick lined, built at base of chimney or against outside of building. Vertical by-pass grate and by-pass flue behind it built into incinerator chamber insure necessary air circulation to dry moist material between burnings, and to provide top surface burning needed for complete, odorless combustion. Waste of all kinds deposited through hopper door in incinerator or in flue on floors above. When chamber is nearly full, refuse is lighted with a match at top. Inside flue dimensions 12″ x 12″. Fire-safe; sizes for any structure. Outdoor types.

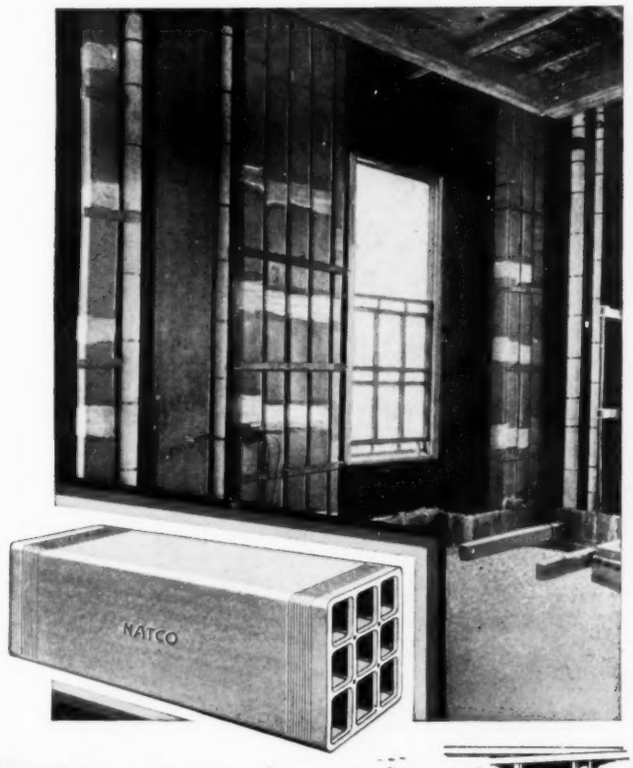
Seco Incinerator Co.

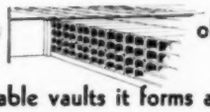
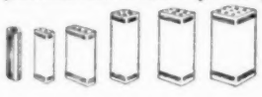
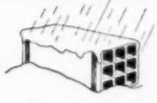
Seco No. 2, basement installation usually, requires flue and gas connection. Capacity 2½ bu., diameter 21″, height 38″, flue collar 7″, pilot light manual visible, finish aluminum and black, gas service ½″. Flame at bottom of combustion chamber; baffle spreads a second flame at top. Gas shut-off valve usually placed at side, 9½″ high, 3″ wide, 2″ deep; ½″ pipe openings. Other size units for larger buildings; also chimney fed and outdoor types.

THE PRESENT DOLLAR MEASURES THE COST - THE FUTURE DOLLAR THE PROFIT

THE APPLICATION OF *Natco* CLAY CONDUIT IN THE BUILDING INDUSTRY

For Permanent Cable Protection



AFTER thirty-eight years of service underground, Natco Clay Conduit now demonstrates its excellence in above ground applications. Incorporated into the walls or under floors  of telephone or telegraph buildings, repeater stations, power stations, fire stations, shop buildings or cable vaults it forms an ideal chase for power, signal and communication cables, offers the most permanent duct space per dollar expended. It has great strength . It comes in convenient size units  , displaces and replaces structural material that would otherwise be required, becomes an integral and ever-lasting part of the wall. Permanent in character and in form, Natco Clay Conduit assures permanent protection. Non-combustible, it enhances the fire safety of the wall in which it is incorporated. It will not corrode; is unaffected by heat, cold  moisture acids or alkalies ; and contains no elements that will harmfully affect the cable sheath.

With all these advantages, Natco Clay Conduit offers economies that amaze prospective users. May we have the opportunity to furnish details and estimates on conduit for interior cables in building projects above described—also for outside cables serving any type of group building projects.

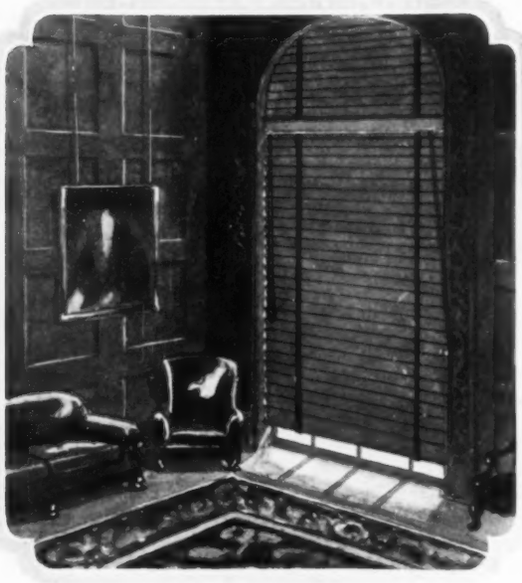
NATCO
THE COMPLETE LINE of STRUCTURAL CLAY TILE

NATIONAL FIREPROOFING CORPORATION

General Offices: Fulton Bldg., Pittsburgh, Pa. Branch Offices: New York, Chanin Bldg.; Chicago, Builders Bldg.; Philadelphia, Architects Bldg.; Boston, Textile Bldg.; Washington, D.C., National Press Bldg.; Birmingham, Ala., Martin Bldg. In Canada: National Fire Proofing Company, of Canada, Ltd., Toronto, Ont.

The largest concern in the world manufacturing a complete line of Structural Clay Tile and Underground Clay Conduit.

Planning for the CONTROL of light and air is only next in importance to planning for the windows.



In the interest of window efficiency and finish, "Kane Quality" Venetian Blinds are being architecturally specified with increasing frequency. When a building is turned over to its owners, the important problem of light and air control is permanently solved.

"Kane Quality" Venetian Blinds have a number of exclusive features that insure a long life of smooth operation and utmost efficiency. They are, besides, available in any color called for by the decorative scheme. Our new folder, illustrated in full color, and also a valuable A. I. A. folder, both tell much that the architect wants to know, when he is writing specifications. Copies will be mailed promptly on request.

"Kane Quality"
VENETIAN BLINDS

SINCE "KaneQuality" 1890

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Also Wood and Metal Frame Rustless Insect Screens, including the new Kane development, the Lift-Fold Screen—and new Roll Screens

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Dept. A-7, Kane, Pa.

Please send your illustrated folder on ☐ Venetian Blinds ☐ Wood and Metal Frame Rustless Insect Screens ☐ Lift-Fold Screens ☐ Roll Screens.

Name_____

Address_____

GAS FLOOR FURNACE

Payne Furnace and Supply Co.

Miniature pipeless furnace for small houses with or without basements, or an auxiliary heater in larger houses. Gas burner, vented to atmosphere, housed in all-welded, gas-tight furnace, set just below floor register. Furnished with key and pilot, electro-manual spark lighter, electric push button or thermostatic control. Affords an instantly available circulating flow of warmed air. Cold air is drawn off the floor through intake portions of register, heated and returned to room. Air column never comes in contact with flame. Made in three sizes. Registers 16″ x 16″, 16″ x 24½″ and 24½″ x 24½″. Furnace dimensions (smallest) 13¾″ wide by 13¾″ long by 30″ deep, (largest) 22″ x 22″ x 30″. Each has ½″ gas supply, one burner and 3″ vent. 550 B.t.u. manufactured gas consumed per hour 28 cu. ft., 36 cu. ft., 64 cu. ft., respectively.

FIBERDUCT AND FITTINGS

General Electric Co.

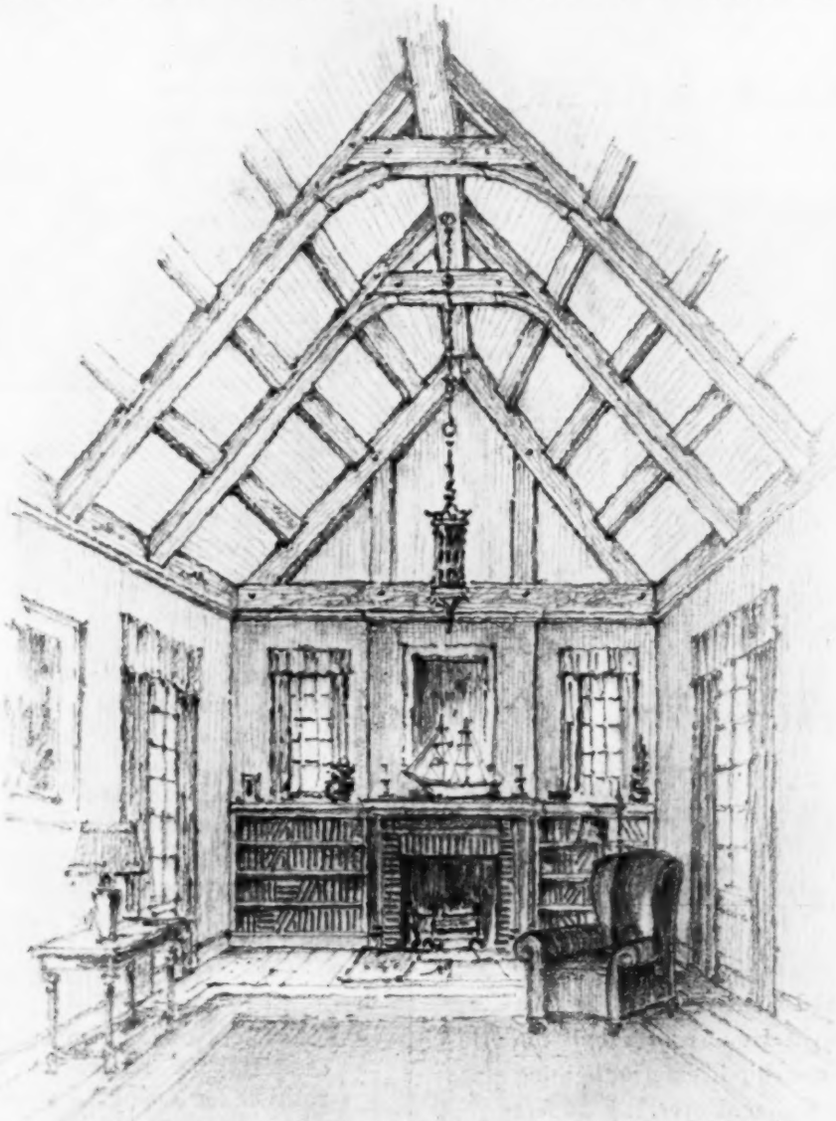
Made of noncorrodible fiber, oval-shaped; code requires ¾″ concrete above top. Furnished in 5′ lengths. Long used satisfactorily in larger structures; well suited for under-floor wiring in residential work to facilitate use of appliances and electrified furniture. Fittings include duct supports and couplings, leveling screws, floor and wall elbows, crossunders, duct-to-conduit adapter, compartment junction boxes and cover assemblies for use in concrete and linoleum floors, telephone and lighting or convenience outlets, and other needed surface fittings. All outlets consist of threaded riser, brass coupling and insulated head. There is no metal to touch when plugging in the cap. Outlet floor flange fits flush with finish floor. To abandon an outlet, riser is replaced by a water-tight, flush, closing plate.

FIREPROOFING INSULATION

Thermax Corp.

Long, hardwood fibres with binder of high temperature cement formed by heat and pressure into slabs 1″, 2″ and 3″ thick, 20″ wide, 48″ and 64″ long. For one price, in one operation, material gives insulation, sound deadening and acoustical properties, fireproofing, vermin-proofing. Recommended as plaster, stucco, cement and plastic paint base, sheathing, general utility building board, roof slab, partition block (nonbearing) and sound deadener for floors. Saws and nails easily. Just being placed on American market but used for twelve years in Europe under name "Heraklith." Odorless, permanent, material exhibits no perceptible warp, buckle, expansion or contraction in presence of heat or cold, moisture or aridity. Nonabsorbent, lighter than gypsum block, stronger than fibre board. Heat from blow torch will melt nails driven through material without damaging it.

JOHNS-MANVILLE INSULATING BOARD



A REAL STRUCTURAL INSULATION

Unusually interesting interiors can be economically created with Johns-Manville Insulating Board. In surface texture, it suggests the feeling of a wall fabric. Its color—a soft, subdued écru combined with its structural strength permit wide range of application. In basement, attic, garage or outbuilding, it is a valuable aid to comfort—a practical help in the utilization of waste space. Let us send you full information and samples. Address your inquiries to Johns-Manville, 292 Madison Avenue, New York City.

JOHNS - MANVILLE
ARCHITECTURAL SERVICE DEPARTMENT

ARCH
SCULP
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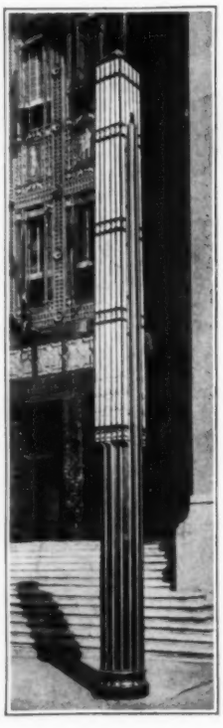
EXTERIOR LIGHTING FIXTURES

by

SMYSER-ROYER



Flood Light Standard
FIDELITY MUTUAL LIFE INSURANCE COMPANY
Philadelphia, Pa.
ZANTZINGER, BORIE & MEDARY
Architects

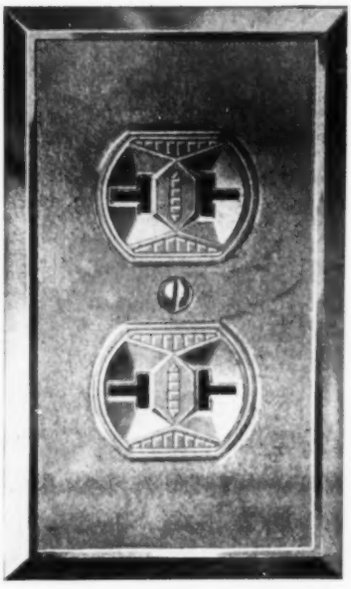
THIS flood light standard in Cast and Wrought Iron is typical of the fine craftsmanship in exterior lighting fixtures by Smyser-Royer. It is 26 feet high and is one of a pair designed by Zantzinger, Borie and Medary, Architects, to serve as a flood light standard and street lamp for the Fidelity Mutual Life Insurance Co., in Philadelphia. Beauty of design has been blended with craftsmanship in metals to produce a fixture as enduring as the building itself.

SMYSER-ROYER COMPANY

MAIN OFFICE AND WORKS - - - - YORK, PA.
PHILADELPHIA OFFICE - - 1700 WALNUT STREET

SLOT-FINDER OUTLET

Harvey Hubbell, Inc.
Arrow-Hart & Hegeman Electric Co.



Single and double convenience outlets with slot finders or finding ridges. When prongs or blades of plug are pressed against face of outlet they are turned right into the slots. Eliminates blind groping for holes when seeking to insert plug in outlet.

RADIOVISION

Jenkins Television Corp.

Model 202 Radiovisor salon console intended for reception of 48-line, 15 picture-per-second signals. Synchronizing accomplished by operating on same 60-cycle power system as that supplying transmitter. Walnut cabinet with hinged top includes scanning drum and selector shutter disc, giving accurate cutoff of scanning lines and insuring a clear, sharp image. Synchronous motor supplies driving power. Special television lamp provided; lamp holder will take any standard television lamp. Adjustments provided for centering lamp for maximum and uniform screen illumination. Cabinet front contains a shadow-box lens system through which radiovision images are viewed in enlarged form. Panel below lens carries two main toggle snap switch controls. One throws receiver either to speaker position for tuning in signals or to the picture position for viewing images. The second operates motor and also serves for vertical framing of pictures. Horizontal framing of pictures is accomplished by a handle on side of cabinet. May be employed with any short-wave receiver covering the wave band of 100 to 150 meters and provided with a satisfactory power amplifier. Loud speaker also required.

Experimental radio television stations are in operation at many points. The maker of this receiver operates stations W2XCR, New York City, 2035 Kilocycles, 3 to 5 and 6 to 9 P. M., and W3XK, Washington, 2065 Kilocycles, 5 to 6 and 10:30 to 12:30 P. M., each weekday, in conjunction with the De Forest Radio Company's radio telephone transmitter, station W2XCD, Passaic, 2035 Kilocycles, 9 to 10:30 P. M.